

Sessions for Friday, May 08

Friday, 08:00 AM - 09:30 AM

←	Friday, 08:00 AM - 09:30 AM, Columbia 1	Track: Behavior in Operations Management
	Session: Buyer-Supplier Market Behavior	
	Chair(s): Wedad Elmaghraby	

060-0528 Field Experiment in B2B Auctions

Wedad Elmaghraby, Associate Professor, University of Maryland, United States
Anand Gopal, Associate Professor, University of Maryland, United States
Ali Pilehvar, Student, University of Maryland, United States

We report on the results of a field experiment that we ran on the auction site of one of the nation's largest online auction wholesale liquidation sites. Our empirical analysis of the data indicates that the auction prices for used iPads are fairly insensitive to starting price and assortment.

060-0714 The Wisdom of Crowds: Forecasting Using Prediction Markets

Ruomeng Cui, Assistant Professor, Indiana University Bloomington, United States
Antonio Moreno-Garcia, Assistant Professor, Northwestern University, United States

Prediction markets are virtual markets created to aggregate predictions from the crowd. We examine data from a public prediction market over 8 years. We study the efficiency of these markets to improve sales forecasting, identify experts to better extract wisdom from the crowd and analyze consequences in operations management.

060-1435 Mitigating Supplier Risks: An Experimental Evaluation

Basak Kalkanci, Assistant Professor, Georgia Institute of Technology, United States

Using economic experiments, we evaluate the performance of supplier improvement versus diversification to mitigate supply chain risks. We also investigate the role of buyer commitment on the overall profitability of the supply chain.

↺	Friday, 08:00 AM - 09:30 AM, Columbia 2	Track: Closed Loop Supply Chains
	Session: Consumer Returns in Closed-Loop Supply Chains	
	Chair(s): Necati Ertekin	

060-0035 The Impact of Open-box Returns on Pricing, Return Policy, and Order Decision

Necati Ertekin, Student, Texas A&M University College Station, United States
Michael Ketzenberg, Associate Professor, Texas A&M University College Station, United States

Increasingly, retailers are turning to selling returns in their own primary outlets, side-by-side with new product offerings. However, it remains unclear how a retail strategy of selling returns internally should be implemented. Our study addresses this issue and sheds light on the potential cannibalization between new and returned products.

060-0353 Measuring the Value of Return Policies to Consumers

Guangzhi Shang, Assistant Professor, Florida State University, United States
Pelin Pekgun, Assistant Professor, University of South Carolina, United States
Michael Galbreth, Associate Professor, University of South Carolina, United States
Mark Ferguson, Professor, University of South Carolina, United States

Lenient return policies are popular in the industry. However, how much consumers value such a policy is difficult to measure from firm's perspective. We tackle this challenge and measure the value of return policies to consumers in the online retail context.

060-0355 "Bricks and Clicks" - The Impact of Consumer Returns on the Multichannel Sale Strategies of Manufacturers

Paolo Letizia, Assistant Professor, Erasmus University Rotterdam, Netherlands
Terry Harrison, Professor, Penn State University University Park, United States

Direct online sales offer important business opportunities to brand manufacturers but pose the challenge of consumer returns. We show that the design of the sale channel by manufacturers depends on the salvage value for returns.

060-0948 An Empirical Analysis of Return Episodes in Retailing

Aydin Alptekinoglu, Associate Professor, Penn State University University Park, United States
Paul Messinger, Associate Professor, University of Alberta, Canada
Michele Samorani, Assistant Professor, University of Alberta, Canada

A product return episode is a sequence of transactions composed of the purchase of a product, a return of that product, a repurchase of a similar product, etc., concluding with a final purchase or return. We empirically study return episodes using data from a national consumer electronics retailer.

↻	Friday, 08:00 AM - 09:30 AM, Columbia 3	Track: Empirical Research in Operations Management
	Session: Supply Chain Empirical Research - I	
	Chair(s): Hsiao-Hui Lee	

060-0032 What Drives Supplier Selection Decisions? A Firm-level Investigation in the Automotive Industry

Florian Badorf, Student, Kuehne Logistics University, Germany
Kai Hoberg, Associate Professor, Kuehne Logistics University, Germany
Felix Papier, Associate Professor, Essec Business School, France

We analyze the relationship between firm-level factors such as relationship strengths, market share or financial stability and the probability that a supplier is selected for a sourcing project. We develop an econometric model and apply empirical data from the automotive industry with more than 63,000 supplier selection decisions.

- 060-0159** Selecting High-technology New Business Ventures as Suppliers
Constantin Brachtendorf, Student, Swiss Federal Institute of Technology Zurich, Switzerland
Christoph Bode, Professor, Universitat Mannheim, Germany
Stephan Wagner, Professor, Swiss Federal Institute of Technology Zurich, Switzerland


Many firms strive for an entrepreneurial orientation (innovativeness, risk-taking propensity, and proactiveness) to deal with today's dynamic business environment. As such, they can potentially benefit from sourcing from high technology new business ventures (HT-NBVs). This study examines how firms select HT-NBVs as suppliers by means of a discrete choice experiment.

- 060-0507** Assessing Supply Chain Quality Risk Management Strategies and the Implications on Quality Performance
Sarah Wu, Associate Professor, Fordham University, United States
Xiande Zhao, Professor, China Europe International Business School, China
Dongli Zhang, Assistant Professor, Fordham University, United States

The study aims to identify different quality risk management strategies, which reflect how firms handle quality risk. This study also explores the relationships of different kinds of quality risk management strategy in order to sustain or improve the quality performance of a focal firm along the supply chain.

- 060-0710** Do Responsible Buyers Prefer to Sources from Responsible Suppliers?
Hsiao-Hui Lee, Assistant Professor, University of Hongkong, China

This paper investigates if buyers select suppliers' by their corporate social performance (CSP). We first show that a buyer is likely to form a supply-chain relationship with a supplier having similar CSP. However, this matching phenomenon is weakened when buyers face stronger competition or expensive suppliers.

	<div>Friday, 08:00 AM - 09:30 AM, Columbia 4</div> <div><i>Track:</i> Scheduling and Logistics</div> <div><i>Session:</i> Production Scheduling and Logistics</div> <div><i>Chair(s):</i> Zhili Tian</div>
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- 060-1277** Category Captain's Orders: Integrated Optimization Modeling at the Supply Chain's Fulcrum
James Hamister, Associate Professor, Wright State University, United States
Michael Magazine, Professor, University of Cincinnati, United States
George Polak, Professor, Wright State University, United States

We formulate a LP that provides bounds for a model that integrates sourcing, order lot-sizing, and immediate downstream distribution decisions to utilize a Category Captain's leverage across a supply chain. We solve it for a large-scale data set provided by a distributor of HVAC products and develop decision support tools.

- 060-0973** Combining DES, Optimization and Heuristics to Improve Steel Plates Thermal Treatment Scheduling
Roberto Revetria, Professor, Universita Degli Studi De Genova Diptem, Italy
Piero Giribone, Professor, University of Genoa, Italy
Lorenzo Damiani, Lecturer, University of Genoa, Italy

This paper focuses on thermal treatments of steel plates through an innovative scheduler made of both an optimization and a heuristic algorithm. The aim of this approach is to extend the planning procedure to the virtual material to improve production scheduling by adding more visibility by using a DES approach.

- 060-0408** Understanding Product Line Complexity through Stochastic Lot Sizing Analysis
Zhili Tian, Assistant Professor, Florida International University, United States

We formulate the problem of determining the production run lengths and sequencing the runs in continuous chemical processes with sequence dependent changeover times and uncertain demands. We develop a sequential method to solve this planning program. Through global sensitivity analysis, we generate data for estimating the product line complexity cost.

- 060-0914** Achieving Sustainable Operations through Estate-wide Goods Mover System
SIJIE HO, Student, National University of Singapore, Singapore
Erdem Ceven, Reader, National University of Singapore, Singapore
Linda Wati, Reader, National University of Singapore, Singapore
Mark Goh, Professor, National University of Singapore, Singapore
Robert de Souza, Professor, National University of Singapore, Singapore

Maintaining sustainable logistics operations in urban areas is a challenging task. It requires intensifying land use, minimizing inventory levels, and improving service levels. We investigate "Estate-wide Goods Mover System," which synchronizes freight transportation and distribution operations, using discrete event simulation. We demonstrate the feasibility and effectiveness of the proposed system.

5	Friday, 08:00 AM - 09:30 AM, Columbia 9	<i>Track:</i> Economics Models of Operations
	<i>Session:</i> New product development	
	<i>Chair(s):</i> Saurabh Bansal	

- 060-0610** 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, Clemson University, United States

We consider a manufacturer who takes a natural resource to make two products through co-production technology. Some consumers are green and additionally value conservation of the natural resource. We show that increasing the portion of green consumers may elevate resource consumption.

- 060-1432** Flexible Products for Dynamic Needs
 Aydin Alptekinoglu, Associate Professor, Penn State University University Park, United States
 Karthik Ramachandran, Associate Professor, Georgia Institute of Technology, United States

We address a product strategy question on how to satisfy dynamic consumer needs that change randomly over time. Should a firm offer multiple standard products, each designed for a specific purpose (e.g., several specialized golf clubs), or a flexible product that can be reconfigured on demand (e.g., one adjustable club)?

- 060-1478** Pricing below Cost under Exchange-rate Risk
 John Park, Assistant Professor, Syracuse University, United States
 Burak Kazaz, Associate Professor, Syracuse University, United States
 Scott Webster, Professor, Arizona State University Tempe, United States

This study shows that a firm might price below cost under predatory pricing under exchange-rate risk, departing from the motivations reported in “predatory pricing” and “dumping” literature. It is a robust behavior as it occurs under risk aversion, with financial hedging, in postponed pricing, and under demand uncertainty.

6	Friday, 08:00 AM - 09:30 AM, Columbia 10	<i>Track:</i> Sustainable Operations
	<i>Session:</i> Sustainable and Socially Responsible Supply Chain Management	
	<i>Chair(s):</i> Jason Quang Nguyen	

- 060-0538** The Impact of Informing Buyer on Energy Efficiency Improvements at Supplier
 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 investigate the equipment-focused EE investment decision in the context of a supply chain where a capital constrained manufacturer sets the investment level and its buyer sets contract prices. We solve for the investment level and pricing strategy both when the buyer is and is not informed.

- 060-0548** Managing Social Responsibility in Multi-tier Supply Chains
 Lu Huang, Student, Duke University Durham, United States
 Jeannette Song, Professor, Duke University Chapel Hill, United States
 Robert Swinney, Associate Professor, Duke University Durham, United States

We consider a multi-tier supply chain in which a Tier 2 supplier potentially violates social and environmental standards, resulting in demand and indirect financial loss for a downstream (Tier 0) firm. We analyze the efficacy of both direct and indirect mechanisms to improve responsibility of the Tier 2 supplier.

- 060-1110** Contract Design in Electric Vehicle Supply Chain
 Saravanan Kuppusamy, Assistant Professor, Quinnipiac University, United States
 Michael Magazine, Professor, University of Cincinnati, United States
 Uday Rao, Associate Professor, University of Cincinnati, United States

We consider a electric vehicle supply chain that consists of taxicab companies (TC) and an infrastructure service provider (SP). In this environment, transactions are not based on commodities, but, on services. We examine the SP’s problem of pricing infrastructure services to TCs and identify optimal strategies for the SP.

- 060-1553** Extending Social Sustainability across the Supply Chain: The Role of Social Capital
 Mohammad Alghababsheh, Student, Brunel University, United Kingdom
 David Galleary, Reader, Brunel University, United Kingdom

This paper aims to examine the role of social capital in promoting social sustainable practices among the upstream partners of the supply chain. We argue that the three dimensions of supply chain social capital (i.e. structural, relational and cognitive) will lead to a more collaborative environment between buyer and supplier.

7	Friday, 08:00 AM - 09:30 AM, Columbia 11	<i>Track:</i> Manufacturing Operations
	<i>Session:</i> Strategies and Performance	
	<i>Chair(s):</i> Joel Schedin	

- 060-1331** Enhancing Cross Project Learning during New Product Introduction in Production Systems
Joel Schedin, Student, Mälardalen University, Sweden
Siavash Javadi, Student, Mälardalen University, Sweden
Jayakanth Srinivasan, Senior Lecturer, Massachusetts Institute of Technology, United States
Mats Deleryd, Professor, Mälardalen University, Sweden

We utilized project histories from seventeen projects and interview from key actors in a global organization to understand how experiences from the introduction of new products in production systems are shared across projects. Our data highlight patterns of learning and relearning that inform framework for enhanced experience sharing.

- 060-1469** Operations in Manufacturing Programs: Their Fits to Performance
Cesar Ortega, Student, Universidad Nacional Autónoma de Honduras, Honduras
Maria Lopez, Student, Universidad Nacional Autónoma de Honduras, Honduras
Pedro Garrido-Vega, Associate Professor, Universidad De Sevilla, Spain

Manufacturers are currently facing rapid response markets, which means that implementing manufacturing programs effectively should lead to better performance. Hence, this paper analyzes operations of programs in different industrial contexts with a threefold aim: (1) operations differences in different sectors; (2) programs links to performance; and (3) contexts explaining differences.

- 060-0962** Strategy and Competency-oriented Workforce Management
Hannah Becker, Student, Rwth Aachen University, Germany
Peter Letmathe, Professor, Rwth Aachen University, Germany
Matthias Schinner, Student, Rwth Aachen University, Germany

We present a strategy and competency-oriented workforce management approach, which enables companies to identify required competencies and qualifications of their current and future employees. Besides demographical factors, the approach allows to consider production system complexity, demand volatility and long-term shifts in the firm's production program.

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| 9 | Friday, 08:00 AM - 09:30 AM, Piscataway | <i>Track:</i> Inventory Management |
| | <i>Session:</i> Supply Chain Issues: Inventory Procurement, Pricing and Competition | |
| | <i>Chair(s):</i> Yulan Wang Xiuli He | |

- 060-0704** Demand Uncertainty Reduction Effects in Decentralized Supply Chains
Meng Li, Student, University of Illinois Urbana-Champaign, United States
Nicholas Petrucci, Professor, University of Illinois Urbana-Champaign, United States

This paper studies the effects associated with reducing demand uncertainty in a decentralized supply chain comprising one manufacturer, one retailer, and a wholesale price contract that governs the transactions between them. A selling-to-the-newsvendor model in which the demand uncertainty level is parameterized through a mean-preserving spread is employed, and the manufacturer's and the retailer's optimal decisions are solved accordingly.

- 060-0772** Price and Quality Competition with Variety Seeking Consumers
Erfeng Zhou, Student, University of Science and Technology of China, China
Xin Liu, Student, University of Science and Technology of China, China
Qinglong Gou, Associate Professor, University of Science and Technology of China, China

This paper studies the impact of variety seeking on two firms who target two different markets, when the two firms stick to their own markets in both periods, consumers' preference for variety may force firms exit markets. However, this can be alleviated by exchanging their targeted markets.

- 060-0871** Inventory and Price Decisions with a Salvage Channel
Dennis Yu, Associate Professor, Clarkson University, United States
Chen Xiang, Assistant Professor, Clarkson University, United States

We investigate inventory and price decisions when surplus inventory can be sold through a salvage distribution channel which can be either integrated or independent of the regular retail channel. The impacts of demand uncertainties on optimal inventory, retail price decisions, and expected profit are studied.

- 060-0937** Managing Inventory and Product Substitution under a Flexible Substitution Scheme
He Xu, Professor, Huazhong University of Science & Technology, China
David Yao, Professor, Columbia University, United States
Shaohui Zheng, Professor, Hong Kong University of Science & Tech, China

We study a two-product inventory model that allows substitution. The substitution rule is flexible in the sense that the supplier can choose whether or not to offer substitution with products in stock and at what price or discount level, whereas the customer may or may not accept the offer.

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| 10 | Friday, 08:00 AM - 09:30 AM, Cardozo | <i>Track:</i> Information in Operations Management |
| | <i>Session:</i> Information Security and Quality | |
| | <i>Chair(s):</i> Shirish C. Srivastava | |

- 060-0863** Information Security Awareness and Competitiveness: An Analysis of Brazilian companies
Emerson Beneton, Student, UNIP, Brazil
Rodrigo Gonçalves, Professor, UNIP, Brazil

Ivanir Costa, Professor, UNINOVE, Brazil
Getulio Akabane, Retired, CEETEPS, Brazil
Joao Santos, Student, Universidade Adventista De Sao Paulo, Brazil

This paper studies the perception of Brazilian company's managers regarding the importance of information security and its impact on competitiveness. With a 376 samples could make a parallel between managers behavior and identify the relationship to possible incidents that brought operation unsuccessful.

060-0868 Information Security versus Competitiveness: A Study of Brazilian SMEs

Emerson Beneton, Student, UNIP, Brazil
Emerson Abraham, Professor, UNIP, Brazil
Rodrigo Gonçalves, Professor, UNIP, Brazil
Getulio Akabane, Retired, CEETEPS, Brazil
Joao Santos, Student, Universidade Adventista De Sao Paulo, Brazil

To what extent, the use of best practices in the control of operations, preserving the security can differentiate a company in today's competitive market in Brazil. Based on statistical analysis the competitive performances that adopt best practices in information preserving as a priority.

060-0689 Operational Technologies in Organizations: Privacy Concerns and Productivity

Shirish C. Srivastava, Associate Professor, Hec Paris, France
Shalini Chandra, Assistant Professor, S P Jain School of Global Management, Singapore
Anuragini Shirish, Student, Telecom Ecole de Management (Institut Mines-Telecom), France

In addition to concerns about information privacy, we theorize the influence of operational technologies on worker's spatial privacy concerns and their consequent influence on worker productivity. Results from the study show that spatial privacy invasion does not necessarily have negative outcomes and that privacy-outcome relationships are highly context specific.

060-0406 The Influence of Information Quality on Individual Impact in a Logistics Company

Marcelo Santos, Manager, Correios, Brazil
Gilson Santos, Associate Professor, Universidade Tecnológica Federal do Paraná, Brazil
Francieli Brisol, Student, Universidade Tecnológica Federal do Paraná, Brazil

The objective of this study is to analyze the influence of information quality (IQ) on individual impact (II) perceptions in a logistics company. Self-applied electronic questionnaires were answered by 37 managers of the company. Through regression analysis it was confirmed that some specific dimensions of IQ explain II.

11	Friday, 08:00 AM - 09:30 AM, Du Pont	Track: Humanitarian and Not-for-profit Operations
	Session: Practice-Based Research in Humanitarian Operations Management	
	Chair(s): Maria Besiou	

060-0372 Volunteer Management in Charity Storehouses

Maria Besiou, Associate Professor, Kuehne Logistics University, Germany
Alfonso Pedraza-Martinez, Assistant Professor, Indiana University, United States

We study volunteer management at a large faith-based organization. The whole supply chain operates exclusively with volunteers (from supply to delivery). Using empirical data we build a model to explore the drivers of on-time order fulfillment at the storehouse level.

060-0459 Understanding Fundraising in Humanitarian Supply Chains

Laura Turrini, Student, Kuehne Logistics University, Germany
Maria Besiou, Associate Professor, Kuehne Logistics University, Germany
Joern Meissner, Professor, Kuehne Logistics University, Germany

Donations are generally the main income of humanitarian organizations and are central to their successful operations. We analyze the drivers of donations for public donors in relief and development programs for a big humanitarian organization. Also, we investigate whether we can link operational budget allocation decisions and fundraising strategies.

060-0491 Accident Analysis in a Humanitarian Vehicle Fleet

Nathan Kunz, INSEAD, France
Luk van Wassenhove, Professor, INSEAD, France

Road accidents are the main cause of security related death and injuries in humanitarian organizations (HO). Analyzing a database of 3000 incidents and accidents collected by a HO, we try to understand leading causes of road accidents in humanitarian vehicle fleets. This will help HO to mitigate road accidents risks.

060-0901 Humanitarian Funding in a Multi-donor Market with Donation Uncertainty

Arian Aflaki, Student, Duke University Durham, United States
Alfonso Pedraza-Martinez, Assistant Professor, Indiana University, United States

We analyze the trade-off between humanitarian funding strategies and operational performance. If a Humanitarian Organization (HO) allows donors to earmark their donations, HO's expected funding increases but its operational efficiency decreases. We use the Scarf's minimax approach and the newsvendor framework, and calibrate our model using data from 15 disasters.

12	Friday, 08:00 AM - 09:30 AM, Embassy <i>Session:</i> Humanitarian Operations Management Applications <i>Chair(s):</i> Alfonso Pedraza-Martinez	<i>Track:</i> Humanitarian and Not-for-profit Operations
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060-0367 Problem Formulation and Solution Mechanisms: A Behavioral Study of Humanitarian Transportation Planning

Erica Gralla, Assistant Professor, George Washington University, United States
 Jarrod Goentzel, Lecturer, Massachusetts Institute of Technology, United States
 Charles Fine, Professor, Massachusetts Institute of Technology, United States

This paper investigates the mechanisms by which human operations managers formulate and solve urgent, ill-defined problems, through an in-depth qualitative study of transportation planning in humanitarian response. The findings show that the formulation is derived through an ongoing sensemaking process, while the solution is derived through greedy search.

060-0374 Potential of Social Media for Disaster Management

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

Social media increases the amount of data available to humanitarian workers in the aftermath of disasters. It may also inform the general public. However, little attention has been paid to explore the role of social media on disaster management. We propose a framework to integrate social media in disaster management.

060-1470 Effect of Armed Conflicts on Humanitarian Operations: Efficiency, Total Factor Productivity, and Patient Satisfaction of Rural Hospitals

Andres Jola Sanchez, Student, Indiana University Bloomington, United States
 Alfonso Pedraza-Martinez, Assistant Professor, Indiana University, United States
 Kurt Bretthauer, Professor, Indiana University, United States
 Rodrigo Britto, Assistant Professor, Universidad De Los Andes, Colombia

We study an important but neglected topic in humanitarian operations: armed conflict. We analyze the effect of a conflict on the operational performance of rural hospitals. Using data from Colombian hospitals, we find that a conflict positively affects hospital's total factor productivity (a surprising result), while it negatively affects efficiency.

060-1265 Mobile Money Agent Inventory Management

Karthik Balasubramanian, Student, Harvard University, United States
 David Drake, Assistant Professor, Harvard University, United States
 Douglas Fearing, Assistant Professor, University of Texas Austin, United States

Mobile money agents exchange cash for electronic value and vice versa, forming the backbone of an electronic currency ecosystem in the developing world. We model the agent's inventory problem, unique in that the satisfaction of cash (electronic currency) corresponds to an equivalent increase in inventory of electronic currency (cash).

13	Friday, 08:00 AM - 09:30 AM, Fairchild East <i>Session:</i> Scheduling in Healthcare <i>Chair(s):</i> Nan Liu	<i>Track:</i> Healthcare Operations Management
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060-0225 Managing Patient Arrivals in Service Systems with Multiple Servers

Christos Zacharias, Assistant Professor, University of Miami, United States
 Michael Pinedo, Professor, New York University, United States

We analyze a discrete multi-server queueing model for scheduling customer arrivals in service systems with parallel servers. Theoretical and heuristic guidelines are provided for the effective practice of appointment overbooking to offset no-shows. The benefits of resource-pooling are demonstrated in containing operational costs and increasing customer throughput.

060-0544 Capacity Management for Online Appointment Scheduling

Nan Liu, Assistant Professor, Columbia University, United States
 Peter van de Ven, Research Scientist, IBM, United States
 Bo Zhang, Research Scientist, IBM, United States

Consider an electronic appointment booking system for making online reservations. The system displays a set of available time slots and the patient selects an acceptable slot or leaves if none are acceptable. We study how to make the best offer set of the slots in order to optimize capacity utilization.

060-1121 Planning and Online Scheduling for Appointments with Heterogeneous Access Time Targets

Jivan Deglise-Hawkinson, Student, University of Michigan Ann Arbor, United States
 Aleida Braaksma, Student, CHOIR & Academic Medical Center (AMC) Amsterdam, Netherlands
 Brian Denton, Associate Professor, University of Michigan Ann Arbor, United States
 Mark van Oyen, Professor, University of Michigan Ann Arbor, United States
 Richard Boucherie, Professor, Center for Healthcare Operations Improvement and Research (CHOIR), Netherlands
 Martijn Mes, Professor, Twente University Enschede, Netherlands

We optimize inpatient online scheduling of heterogeneous patient appointments with heterogeneous access time targets and appointment lengths by class. We first solve a static daily level planning model to decide on the day of the appointment, then use a multi-stage stochastic integer program to separately optimize the time slot.

060-1301 Appointment Scheduling under Patient No-show Behavior Using Co-positive Cones

Qingxia Kong, Assistant Professor, Universidad Adolfo Ibanez, Chile
Shan Li, Assistant Professor, Baruch College, United States
Nan Liu, Assistant Professor, Columbia University, United States
Chung-Piaw Teo, Professor, National University of Singapore, Singapore
Zhenzhen Yan, Student, National University of Singapore, Singapore

Overbooking is a common strategy to deal with patient no-shows in an appointment scheduling system. In this paper, we develop a distributional robust optimization model to derive effective overbooking strategies. We calibrate and test our models using two large datasets, one from the US and the other one from Chile.

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Friday, 08:00 AM - 09:30 AM, Fairchild West

Track: Healthcare Operations Management

Session: Hospital operations (MGH)

Chair(s): Ana Cecilia Zenteno Langle

060-0624 Bringing "Amazon" to MGH: Surgical Supply Inventory Management

Bethany Daily, Senior Administrative Director, Massachusetts General Hospital, United States
Ana Cecilia Zenteno, Operations Research Manager, Massachusetts General Hospital, United States
Peter Dunn, Executive Medical Director, Massachusetts General Hospital, United States
Retsef Levi, Professor, Massachusetts Institute of Technology, United States

Massachusetts General Hospital performs 37,000+ operations annually. We will address the operational challenges of managing a highly specialized and time-sensitive surgical supply inventory in light of financial and physical capacity constraints. Operations Management techniques have yielded significant improvements while other problems remain open.

060-1215 Standardization and Guidelines in the Perioperative Environment

Paul St. Jacques, Associate Professor, Vanderbilt University, United States

Efforts to decrease variation in anesthesia care practice may result in decreased costs and improved patient outcomes. Additionally, the establishment of care guidelines may increase safety through improvement in team reliability and communication clarity. We cite the Enhanced Recovery after Surgery protocol and Center for Evidence Based Anesthesia as examples.

060-1728 Workload Balancing in Primary Care

Bethany Daily, TBA, Massachusetts General Hospital, United States
Peter Dunn, Assistant Professor, Harvard Catalyst, United States
Blair Fosburgh, MD, Massachusetts General Hospital, United States
Daniel Horn, MD, Massachusetts General Hospital, United States
Retsef Levi, Professor, Massachusetts Institute of Technology, United States
Vaishal Patel, Student, Massachusetts Institute of Technology, United States
Ana Cecilia Zenteno Langle, Operations Research Manager, Massachusetts General Hospital, United States

In this work, we use mixed-integer optimization to balance workload at the largest Primary Care clinic of Massachusetts General Hospital. We propose minimal changes in the providers' clinical schedule to smooth total expected patient arrival rate across clinical sessions, while balancing the number of providers assigned to support staff.

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Friday, 08:00 AM - 09:30 AM, Gunston East

Track: Global Operational Issues

Session: Ecosystem and Environmental Issues

Chair(s): M. Rammohan Rao

060-1646 How Much Green? Impact of Regulation and Market Structure on Greening Decisions

Prakash Awasthy, Student, Indian Institute of Management Bangalore, India
Jishnu Hazra, Professor, Indian Institute of Management Bangalore, India

We analyze the impact of environmental regulation and market structure on the environmental performance of the firm. We derive conditions under which regulation is counterproductive. We also find conditions when regulation under certain market structure results in better environmental as well as financial performance for the firm.

060-1649 Product Line Design and Positioning Using Add-on Services

Omkar Palsule-Desai, Assistant Professor, Indian Institute of Management Indore, India
Janat Shah, Professor, Indian Institute of Management Udaipur, India
Devanath Tirupati, Lecturer, Indian Institute of Management Bangalore, India

We consider a product-line design and positioning problem in the context of variety creation with a core product and add-on services. The motivation comes from emerging for-profit private healthcare service providers in India. We obtain insights into the implications of the core product on design and add-on services.

Friday, 08:00 AM - 09:30 AM

16	Friday, 08:00 AM - 09:30 AM, Gunston West	Track: Marketing and OM Interface
	Session: Contracts in Decentralized Channels	
	Chair(s): Haresh Gurnani Huiqi Guan	

060-1441 Open Technology: An Operational Perspective

Bin Hu, Assistant Professor, University of North Carolina Chapel Hill, United States

Ming Hu, Assistant Professor, University of Toronto, Canada

Yi Yang, Associate Professor, Zhejiang University, China

Tesla recently opened all patents to competitors. Are there non-altruistic justifications? We use a game-theoretic model to show that although opening a technology potentially intensifies competition, it may also incentivize supplier investment in this technology, leading to reduced procurement costs and higher profits.

060-0860 Optimal Design of Channel Effort

Haresh Gurnani, Professor, University of Miami, United States

Yu Tang, Assistant Professor, University of Miami, United States

Huaqing Wang, Student, University of Miami, United States

Customers buying certain products may lack functional knowledge and need help after purchase. The retailer (or manufacturer) can invest in pre-sales effort to educate customers; We study the service channel design problem with different structures and show that the retailer would even be worse off in a cost-sharing contract.

060-0270 Optimal Buyback Policies in Distribution Channels

Haresh Gurnani, Professor, University of Miami, United States

Thanh Tran, Associate Professor, University of Central Oklahoma, United States

Ramarao Desiraju, Professor, University of Central Florida, United States

We develop a game-theoretic model to explore preference of different buyback policies in a decentralized channel. For risk neutral players, the manufacturer designs optimal contract with different policies to achieve identical expected profits. However, with risk aversion, the preferences are not identical anymore. Our analytical findings corroborate the anecdotal evidence.

060-0569 Leadership, Dominance, and Preeminence in a Channel Structure with a Common Retailer

Fang Fang, Student, University of Miami, United States

Haresh Gurnani, Professor, University of Miami, United States

Harihara Natarajan, Associate Professor, University of Miami, United States

Increasingly, partners of varying strength are coming together to deliver products effectively. Recognizing that a partner's relative standing in the channel determines its ability to gain profits, we propose a framework based on the drivers of channel strength and systematically analyze their impact by comparing the corresponding Stackelberg games.

17	Friday, 08:00 AM - 09:30 AM, Coats	Track: Retail Operations Management
	Session: Topics in Retail Operations	
	Chair(s): Qingning Cao	

060-0712 Two Dimensional Competition between Two Firms Establishing a Social Media Channel

Gulver Karamemis, Student, University of Florida, United States

Asoo Vakharia, Professor, University of Florida, United States

Subhajyoti Bandyopadhyay, Professor, University of Florida, United States

Naren Agrawal, Professor, Santa Clara University, United States

Prior research on channel competition focuses mainly on the comparison of online and bricks-and-mortar channels. We extend this research by modeling two-dimensional competition where both channels are online: company websites and social-media-enabled channels. We analyze the sequential location and price game and report the equilibrium results.

060-0807 Profitability Bounds for Bundles of Digital Goods

Mihai Banciu, Assistant Professor, Bucknell University, United States

Fredrik Odegaard, Assistant Professor, The University of Western Ontario, Canada

Alia Stanciu, Assistant Professor, Bucknell University, United States

Bundles consisting of information goods such as television channels or streaming subscription services are commonplace. In this talk we examine the problem of finding good bounds for the seller's revenue function generated from offering bundles of digital goods of various sizes, while accounting for the dependencies among the bundle constituents.

060-0958 Online Inventory Disclosure: Consumer Uncertainty and Experience

Tolga Aydinliyim, Assistant Professor, Baruch College, United States

Michael Pangburn, Associate Professor, University of Oregon, United States

Elliot Rabinovich, Professor, Arizona State University Tempe, United States

Given varied consumer perceptions of inventory information, online retailers' presentation of such information influences purchase behavior. We investigate optimal inventory disclosure policies assuming two distinct consumer segments: savvy consumers who can predict a retailer's stock levels (even when masked) and naïve consumers who rely on priori (stochastic) beliefs regarding inventory.

- 060-0349** Deriving New Product Quality Parameters for Assortment Planning
Matthew Lanham, Merchandise Data Scientist, Advance Auto Parts, Inc., United States
Ralph Badinelli, Professor, Virginia Polytechnic Institute And State University, United States

We investigate product reviews obtained from a nationwide auto parts retailer website and derive new product quality parameter estimates. Assortment planning is one of the most challenging decisions faced by retailers. The consumer's measure of quality must be better understood and quantified in the era of big data analytics (BDA).

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| 18 | Friday, 08:00 AM - 09:30 AM, Monroe | <i>Track:</i> Product Innovation and Technology Management |
| | <i>Session:</i> Innovation and Product Development in Emerging Economies | |
| | <i>Chair(s):</i> Mukundan R | |

- 060-1633** Technology Policy, Firm Strategy and Innovation Performance in Chinese ASM
Yang Yang, Student, University of Science and Technology, China
Song Hong, Student, University of Science and Technology of China, China
Jin Hong, Associate Professor, University of Science and Technology of China, China
Dingtao Zhao, Professor, University of Science and Technology of China, China
Qian Wang, Assistant Professor, University of Science and Technology of China, China

Using data from the Aircraft and Spacecraft Manufacturing (ASM) in China and matrix analysis model, this article examines the link between state technology policy, enterprise development strategy, and firm innovation performance and also revisits the technology policy-strategy interactive evolution from 1950s to 2010s in ASM?

- 060-0157** Revisiting Publications on Innovation Management in Brazilian Operations Management Journals
Aline Dresch, Student, Federal University of Santa Catarina, Brazil
Flavio Kubota, Student, Federal University of Santa Catarina, Brazil
Paulo Cauchick Miguel, Associate Professor, Universidade Federal De Santa Catarina, Brazil

This study analyzed publications on innovation subject. Peer-reviewed articles were retrieved from 26 Brazilian operations management journals. Some papers' characteristics were identified such as the type and the level of innovation (incremental or radical). Potential opportunities for further research were also raised considering the context of an emerging economy.

- 060-1085** The Innovation Effect of International Technological Mergers and Acquisitions
Chaoliang Ma, Student, University of Science & Technology, China
Zhiying Liu, Professor, University of Science & Technology, China
Xiaofeng Zheng, Student, University of Science & Technology, China

We establish a model of international technological M&A(Mergers and Acquisitions) under demand uncertainty and asymmetric information and analyze the results of Cournot equilibrium, we analyze the innovation effect of the non-merging firm using the Kuhn-Tucker condition, and then discuss the innovation effect of different types of international technological M&A.

- 060-1253** Unraveling the FAST Framework to Analyse Frugal Innovations from India
Mukundan R, Assistant Professor, National Institute of Industrial Engineering, Mumbai, India
Karuna Jain, Professor, National Institute of Industrial Engineering, Mumbai, India

Frugal Innovations (FI), Reverse innovations are considered globally successful innovations from emerging markets. Using the Function Analysis System Technique (FAST), we develop value analyse matrix to identify the difference between Indian FIs that have been successful globally and locally to provide strategic insights to firms to leverage emerging nation capabilities.

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| 19 | Friday, 08:00 AM - 09:30 AM, Holmead East | <i>Track:</i> Service Operations |
| | <i>Session:</i> Call Center Management | |
| | <i>Chair(s):</i> Rouba Ibrahim | |

- 060-0036** Managing Call Centers with Many Strategic Agents
Rouba Ibrahim, Assistant Professor, University College London, United Kingdom
Kenan Arifoglu, Assistant Professor, University College London, United Kingdom

Motivated by real-life work arrangements, such as those in place at Hydro-Quebec, Canada, we study optimal staffing and routing policies in large call centers where agents are strategic in selecting their own work schedules and handled call types.

- 060-0531** Dynamic Priority Scheduling in a Many-server System with Multiple Customer Classes
Jeunghyun Kim, Student, University of Southern California, United States
Ramandeep Randhawa, Associate Professor, University of Southern California, United States
Amy Ward, Associate Professor, University of Southern California, United States

We study how different models for customer impatience affect scheduling decisions. We do this in the context of a many-server queue with multiple classes of customers that are distinguished by their patience distribution. For large systems, we characterize the optimal policy structure as a function of the patience distribution.

- 060-1328** Understanding Customers Retrials in Call Centers: An Empirical Study
Gad Allon, Professor, Northwestern University, United States
Achal Bassamboo, Associate Professor, Northwestern University, United States
Kejia Hu, Student, Northwestern University, United States

We study the impact of waiting times and service quality on the retrial behavior of customers in a call center.

- 060-1576** Optimal Call Center Staffing
Sihan Ding, Student, Center for Mathematics and Computer Science, Netherlands
Ger Koole, Professor, Vrije Universiteit Amsterdam, Netherlands

We formulate the staffing problem in call centers as a newsvendor type problem, where the costs are the initial stand costs plus the traffic management costs. This leads to a new way of call center staffing based on quantiles of the distributional forecasts, and to the optimality of WAPE.

20

Friday, 08:00 AM - 09:30 AM, Holmead West
Session: New Perspectives in Managing Services
Chair(s): Parikshit Charan

Track: Service Operations

- 060-0215** Analysing the Strategic Service Vision and Its' Performance Implications: A Case of Two Eco-resorts
Parikshit Charan, Assistant Professor, Indian Institute of Management Raipur, India
Sanat Panda, Central Excise Officer, Directorate General of Central Excise Intelligence, Raipur Regional Unit,, India
Jitendra Madaan, Assistant Professor, Indian Institute of Technology Delhi, India

The paper uses Terry Hill framework and strategic service vision concept to analyze two eco-resorts. And recommend possible operational solutions using the four things i.e. Service Offerings, Funding Mechanism, Employee Management & Customer Management, a service business must get right. And its implications on its' performance.

- 060-0471** Customer Service Orientation in Adhesion Contracts
Kleber Nobrega, Professor, Universidade Potiguar, Brazil
Murielle Cristina Ramalho, Assistant Professor, Universidade Potiguar, Brazil
Thereza Angelica Santos, Assistant Professor, Universidade Potiguar, Brazil

This paper compares the service orientation degree for cable tv contracts from five companies, based on a theoretical model developed to this purpose. Through CVI test, eight judges's responses were analysed, showing general orientation and the most outstanding dimensions. The results indicate that contracts have moderate service orientation

- 060-0839** Designed to Recover: New Service Design That Anticipates Service Recovery
Amitkumar Kakkad, Assistant Professor, University of San Diego, United States

This paper reviews the extant literature on service recovery, and proposes a framework for New Service Design that anticipates service failures and the resultant need for service recovery. Propositions are developed and validated through a case study of six service firms, and tested through a wide-scale survey of service firms.

- 060-0056** Knowledge Management in Service Industry: Meta-analysis
Fahmi Khalid, Student, University of North Carolina Willmington, United States

This paper investigates and measures the importance of knowledge management in service industry using meta-analysis concept. This model will help organizations to acknowledge the importance of knowledge management to optimize customer satisfaction and increase the level of organizational performance. Theoretical concept of value creation is used to support the argument.

- 060-0470** Importance-frequency Matrix: Proposition of a Tool to Compare Services in Accounting Organizations
Kleber Nobrega, Professor, Universidade Potiguar, Brazil
Thereza Angelica Santos, Assistant Professor, Universidade Potiguar, Brazil
Murielle Cristina Ramalho, Assistant Professor, Universidade Potiguar, Brazil
Lieda Souza, Senior Lecturer, Universidade Do Minho , Portugal

This research presents a tool to compare services in accounting organizations to evaluate their competitiveness. The tool includes a roll of services, identifies both the importance and frequency, and allows a comparison between different companies considering mandatory and classification of services.

21

Friday, 08:00 AM - 09:30 AM, Kalorama
Session: Empirical Supply Chain Research 1
Chair(s): Jun Li Nikolay Osadchiy

Track: Supply Chain Management

- 060-0180** The Impact of Supply Chains on Firm-level Productivity
Juan Serpa, Student, University of British Columbia, Canada
Harish Krishnan, Associate Professor, University of British Columbia, Canada

We collect data on 27,000 vertical relationships to study the importance of different channels of productivity spillovers. We explore the influence of two types of spillovers: (i) endogenous spillovers, i.e. the impact of knowledge transfers and; (ii) exogenous spillovers, i.e. the impact of the partners' characteristics on the firm's productivity.

060-0473 How Does Supply Network Structure Affect Risk Aggregation?

Yixin (Iris) Wang, Student, University of Michigan Ann Arbor, United States

Jun Li, Assistant Professor, University of Michigan Ann Arbor, United States

Ravi Anupindi, Professor, University of Michigan Ann Arbor, United States

The goal of this research is to assess interdependency of risks in supply network and to understand the process of risk aggregation using firm-level supplier relationship data. We concentrate on the impact of tier-2 overlapping. Our research aims to help firms manage risks more efficiently and acknowledge sub-tier importance.

060-0741 Market Competition and Firm Efficiency Effects on Product Recalls

George Ball, Student, University of Minnesota, United States

Rachna Shah, Associate Professor, University of Minnesota, United States

Kaitlin Wowak, Assistant Professor, University of Notre Dame, United States

Theory indicates that market competition and firm efficiency should lead to higher product quality. We combine market and firm level data with pharmaceutical recall data in a 10-year panel and demonstrate that while firm efficiency improves product quality, market competition may surprisingly lead to lower quality and more product recalls.

060-1359 Supply Chain Disruptions: Evidence from the Great East Japan Earthquake

Vasco Carvalho, Associate Professor, Cambridge University, United Kingdom

Makoto Nirei, Associate Professor, Hitotsubashi University, Japan

Yukiko Saito, Senior Fellow, RIETI, Japan

Alireza Tahbaz-Salehi, Assistant Professor, Columbia University, United States

Do local shocks propagate through production networks? This paper uses a novel large-scale dataset on Japanese firm-level production networks together with information on firm-level exposure to large, but localized, natural-disaster (the Great East Japan earthquake) to answer this question.

22

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

Session: Innovation in Supply Chains

Chair(s): Ayhan Aydin

Track: Supply Chain Management

060-0639 Innovation across the Supply Chain

Janice Carrillo, Associate Professor, University of Florida, United States

Cheryl Druehl, Associate Professor, George Mason University, United States

Juliana Hsuan, Associate Professor, Copenhagen Business School, Denmark

Supply chain innovations offer a unique source of competitive advantage beyond product innovation. We synthesize recent research on innovation in the supply chain, such as customer and supplier collaboration and involvement, open innovation, and distributed innovation. We conclude with potential areas for future research.

060-0728 Adoption and Financing of Core Technologies by Consumer Markets

Ayhan Aydin, Assistant Professor, George Mason University, United States

Rodney Parker, Associate Professor, University of Chicago, United States

Consumer markets indirectly finance the development of upstream core technologies. Under competition among firms and industries, we show: the conditions under which some technological capabilities are preferred over the others, if and how far the consumer markets want supply chains to invest in them, and consumer markets' willingness to pay.

060-1174 Innovation in the Brazilian Automotive Chain

Antonio Galhardi, Professor, Centro Estadual de Educação Tecnológica Paula Souza, Brazil

Getulio Akabane, Retired, CEETEPS, Brazil

Marília Azevedo, Professor, Centro Estadual de Educação Tecnológica Paula Souza, Brazil

This paper presents how the Organizational Decomposition of the Innovation Process – ODIP in Automotive Global Companies is contributing to the geographical dispersion of innovation activities towards industrialized developing countries. Especially discuss some important questions related to the implications of R&D re-location in developing countries as Brazil.

060-1010 Increasing Manufacturer's Attractiveness in a Digitalized Distribution Network through Innovative Logistics

Otti Kettunen, Research Scientist, Vtt Technical Research Centre of Finland, Finland

Kai Häkkinen, Senior Research Scientist, Vtt Technical Research Centre of Finland, Finland

Logistics demands are changing rapidly due to digitalization and globalization. How can a manufacturer increase its attractiveness in the eyes of its key dealers and distributors with the help of reorganizing logistics? What kinds of new roles are available for logistics operators? What demands does e-commerce set for manufacturer's logistics?

23

Friday, 08:00 AM - 09:30 AM, Morgan
Session: Supply Chain Coordination 1
Chair(s): Dongli Zhang

Track: Supply Chain Management**060-0128** Coordination in the Assembly System with Quality Uncertainty and Dual Supply Modes

Chongping Chen, Student, Sun Yat-Sen University, China
Zhixiang Chen, Professor, Sun Yat-Sen University, China

This paper investigates an assembly system with one assembler and two independent suppliers. One supplier is perfectly reliable in quality and quantity for providing important components, while the another supplier is unreliable in quality and quantity for providing unimportant components. We assume the assembler make a 100% scanning for the defective components with inspection errors. The components which are found defective will be returned to suppliers, and the products assembled with defective components will be returned by consumers to the assembler for repairing. We construct a Nash game between the assembler and the two suppliers to get their equilibrium procurement and production strategies. We propose a scheme, i.e, the quality-compensation and advance payment contract to coordinate the supply chain decision, in which the unreliable supplier compensates the assembler for the defective products that are inadvertently sold to consumers, and the assembler partially pay to the two suppliers in advance. Analysis shows that the contract fully coordinates the supply chain.

060-0217 Demand and Cost Disruptions and Coordination of the Supply Chain under Advertising Level Dependent Demand

Lingxiao Yuan, Student, Huazhong University of Science & Technology, China
Chao Yang, Professor, Huazhong University of Science & Technology, China

We investigate advertising level, pricing and production decision problems in a supply chain when demand and cost disruptions occur simultaneously. The channel consists of one manufacturer and one retailer where demand depends on retail price and advertisement expenditure. We examine the case in both cooperative game and non-cooperative Stackelberg game.

060-0243 Trust across Supply Chain Partners: The Influence on Supply Chain Coordination Practices and Performance

Dongli Zhang, Assistant Professor, Fordham University, United States
Sarah Wu, Associate Professor, Fordham University, United States

This research is designed to investigate the following research questions:1. Does different inter-organizational trust level influence the implementation of certain supply chain coordination practices?2. Does trust moderate the relationship between the practices and performance? 3. Do contextual factors (e.g. environmental uncertainty) influence the moderating role of trust?

060-0567 VMI in Single-vendor Multiple-retailer Supply Chains with Advertising and Sales Effort

Ashis Chatterjee, Professor, Indian Institute of Management Calcutta, India
Arqum Mateen, Assistant Professor, Indian Institute of Management Kozhikode, India

We present a VMI model as a Stackelberg game in which the vendor, who is the leader, does advertisement expenditure, while the retailers make sales and marketing effort. Results indicate that market-related parameters, especially the VMI service payment as well as the market size have a significant impact on profits

24

Friday, 08:00 AM - 09:30 AM, Northwest
Session: Revenue Management for the Travel Industry
Chair(s): Pelin Pekgun

Track: Revenue Management and Pricing**060-0449** What Can We Learn from Price Volatility of Revenue-managed Goods? Evidence from the Airline Industry

Benny Mantin, Assistant Professor, University of Waterloo, Canada
Eran Rubin, Assistant Professor, Holon Institute of Technology, Israel

The airline industry has embraced the internet to frequently update prices of airline tickets. Can price movements induce consumers to pay more for the tickets and increase sales volumes? Controlling for market characteristics, we explore the link between price volatility, sales levels, as well as transacted airfares' dispersion and levels.

060-0990 Surcharges as a Form of Price Discrimination in Liner Shipping

Michele Acciaro, Assistant Professor, Kuehne Logistics University, Germany

Surcharges are a common feature of liner shipping pricing strategies that has hardly been studied. This paper develops an economic model that offers an explanation of both the rationale and the implications for cargo owners of the use of surcharges as a form of price discrimination in shipping.

060-1239 Hotel Standby Upgrades: How and When Do They Work?

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

Inspired by "e-standby upgrades" in the hotel industry, this study examines how and when these upgrades can provide additional revenue for a hotel. We develop optimal pricing strategies under both myopic and strategic customer behavior through an analytical model and compare these strategies with traditional methods.

060-0933 Estimating Price Elasticities in the Travel Industry under Revenue Management Controls

Pelin Pekgun, Assistant Professor, University of South Carolina, United States
Paul Griffin, Professor, Georgia Institute of Technology, United States

Pinar Keskinocak, Professor, Georgia Institute of Technology, United States

We address the challenges in estimating the price elasticity of customers with a focus on the endogeneity problem, which can arise when revenue management controls are present and result in biased estimates. We present an instrumental variable approach that can correct for the endogeneity through an empirical study.

25

Friday, 08:00 AM - 09:30 AM, Oak Lawn

Track: Risk Management in Operations

Session: Managing Operational Uncertainties and Financial Uncertainties in Supply Chains

Chair(s): Yu Tang

060-0200 Exchange Rate and Global Supply Chain Design: Evidence from Korean Global Companies

Seung Jae Park, Assistant Professor, Texas A&M University-Central Texas, United States

Seungrae Lee, Associate Research Fellow, Korea Institute for International Economic Policy, Korea, Republic of (South Korea)

We consider long-term and the short-term strategies (i.e., plant location and inventory level decisions) of multi-national corporations when their home country is one of export-oriented countries with small domestic markets. We empirically confirm our analytical findings using plant-level data of Korean multi-national corporations.

060-0306 Production Chain Disruptions: Operational Measures and Insurance

Lingxiu Dong, Associate Professor, Washington University St Louis, United States

Yu Tang, Assistant Professor, University of Miami, United States

Brian Tomlin, Associate Professor, Dartmouth College, United States

We analytically explore the use of BI insurance and operational measures to mitigatedisruption risk in a multi-stage production chain. We characterize the firm' soptimal insurance policy-the deductible and coverage limit-and the optimalinventory level at each stage. We examine the interaction between insurance andinventory investments.

060-0434 Supplier Diversification under Random Yield and Price Dependent Demand

Lingxiu Dong, Associate Professor, Washington University St Louis, United States

Guang Xiao, Student, Washington University St Louis, United States

Nan Yang, Assistant Professor, Washington University St Louis, United States

We consider a firm's supply diversification problem under supply random yield and price sensitive demand. We study two pricing schemes: responsive pricing and ex ante pricing. We characterize the sourcing decisions under each pricing scheme and compare them to study the strategic relation between diversification and responsive pricing.

060-0737 Production, Capacity, and Liquidity of a Self-financed Firm

Jie Ning, Assistant Professor, Case Western Reserve University, United States

Matthew Sobel, Emeritus Professor, Case Western Reserve University, United States

A firm's capacity enables and constrains its production. Similarly, its capital enables and constrains its investment. The production fuels capital but possibly depreciates capacity, while investment rebuilds capacity but drains capital. We study the dynamic production, investment, and liquidity policies of a self-financed firm in a risky environment.

27

Friday, 08:00 AM - 09:30 AM, Parlor A

Track: General Track

Session: Teaching Operations Management

Chair(s): Dana Johnson

060-0426 Student Facilitated Learning in Project Management: A Case Study

Dana Johnson, Professor, Michigan Technological University, United States

Linda Wanless, , ,

Engaging students in the learning process is important for knowledge retention. PowerPoint and lecture are becoming obsolete. Student facilitated learning was applied in an undergraduate project management course with great success. Students were more involved in the class, participated at a much greater rate, and experienced higher exam averages.

060-1008 Learning and Teaching of Production: Theoretical-empirical Study

Sergio Adelar Brun, Student, Universidade Tecnológica Federal do Paraná, Brazil

Rolf Erdmann, Professor, Universidade Federal De Santa Catarina, Brazil

Antonio Carlos Vaz Lopes, Student, UFGD, Brazil

The overall objective of this study is to present the foundations of learning, identifying and analyzing key concepts and authors and develop a model class that uses a game. The results are classes that use didactic and pedagogical elements, changing the class and the position of teacher and students.

060-1551 Assurance of learning as a lean improvement tool for higher education

Jan Riezebos, Associate Professor, University of Groningen, Netherlands

The use of lean tools for improving the two primary value-adding activities in higher education, instruction and assignments, is investigated. We present a literature review as well as a data-analysis based on an assurance of learning approach to a large undergraduate course. This demonstrates the applicability of lean in education.

Friday, 08:00 AM - 09:30 AM, Parlor B

Track: Purchasing and Supply Management*Session:* Considerations in International Sourcing*Chair(s):* Alessandro Ancarani**060-0975** Internationalization and Public Procurement: An Empirical Study of Italian SMEs

Alessandro Ancarani, Associate Professor, University of Catania, Italy

Marina Turcati, Employee, Ergon Group, Italy

This paper presents the evolution across the last decade of the Italian government information service "ExTender", whose mission is to promote and signal international tenders among Italian SMEs. We conducted a survey on 1800 SMEs, analyzing their strategic potential and attitude towards international public procurement tenders.

060-1066 Ready for Supplier Integration? The Contingency Effects of a Buyer's Complementarity and Compatibility

Sunil Hwang, Lecturer, Yonsei University, Korea, Republic of (South Korea)

Hyojin Kim, Student, Yonsei University, Korea, Republic of (South Korea)

Daesik Hur, Associate Professor, Yonsei University, Korea, Republic of (South Korea)

Basing upon complementarity and congruence theories, we propose that the effect of supplier integration on the buyer's performance depend upon the buyer's resource complementarity and cultural compatibility with the key supplier. Data are collected from over 1200 manufacturing firms from four countries, and hypotheses are tested using hierarchical moderated regression

060-1012 The Impact of Supply Improvement Processes in Strategic Management: A Case Study on an Industrial Restaurant

Julia Barreto, Student, Centro Paula Souza, Brazil

Hamilton Pozo, Retired, Centro Paula Souza, Brazil

Gilberto Mourao, Student, Centro Paula Souza, Brazil

Getulio Akabane, Retired, CEETEPS, Brazil

Vicente Sinkunas, Student, Centro Paula Souza, Brazil

In order to understand the relationship between Strategic Management and Process Management, this case study aims to identify the impact of a process improvement project in results of an industrial restaurant chain in Brazil. The research analyzed the current Supply Processes and proposed improvements that achieved financial and qualitative gains.

060-1671 "Steppin' to the Bad Side": Potential Negative Effects of the Collaboration Relationship

Chen Yen-Tsang, Student, Eaesp - Fgv, Brazil

Ely Paiva, Associate Professor, Fundacao Getulio Vargas, Brazil

By past buyer-supplier relationship (BSR) being a supplier selection criterion, it makes the selection process vulnerable to relational side effects. Through controlled experiment and cross-national (Brazil/China) data collection, we demonstrated causal relationship and harmful effects between BSR and selection process. Additionally, controversial selection priorities and relation-orientation cultural influence discussed.

Friday, 10:00 AM - 11:30 AM

30	Friday, 10:00 AM - 11:30 AM, Columbia 1	Track: Behavior in Operations Management
	Session: Behavior in Supply Chains	
	Chair(s): Maximiliano Udenio	

060-0422 Behaviorally Robust Screening of Asymmetric Forecast Information

Lennart Johnsen, Student, Universitaet Magdeburg, Germany

Guido Voigt, Assistant Professor, Universitaet Magdeburg, Germany

We investigate the capacity investment decision of a supplier producing a component for a manufacturer with private forecast information. We test in laboratory experiments the performance of capacity reservation contracts (menu-of-contracts) that consider inequity aversion, risk preferences, and bounded rationality.

060-1166 Understanding Mental Cost Models in Beer Game Experiments

Maximiliano Udenio, Student, Technische Universiteit Eindhoven, Netherlands

Jan Fransoo, Professor, Technische Universiteit Eindhoven, Netherlands

In this study we investigate the underlying behavior of beer game players with regard to the mental tracking of over- and underage costs.

060-1046 When a Supply-chain Disruption Strikes: Managerial Reactions and Decision-making

Mikaella Polyviou, Student, Ohio State University, United States

A. Knemeyer, Associate Professor, Ohio State University, United States

Johnny Rungtusanatham, Professor, Ohio State University, United States

In this study, we seek to explore how managers react to supply-chain disruptions and understand the reasons for those reactions. Ultimately, we aim to develop a process model of managerial decision-making from the time when managers find out about the disruption until the time they have it resolved.

060-0431 Information Sharing, Advice Provision or Delegation: What Leads to Higher Trust in a Distribution Channel?

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

Upender Subramanian, Assistant Professor, University of Texas Dallas, United States

Yu Wang, Assistant Professor, Jindal School of Management, United States

Retailers often rely on manufacturers' assistance in the form of market information, advice about retail decisions, or may even delegate decisions to manufacturers. Concerns about manufacturer opportunism, however, have led to questions about this practice. We examine which form of assistance leads to the most trust and cooperation than others.

31	Friday, 10:00 AM - 11:30 AM, Columbia 2	Track: Closed Loop Supply Chains
	Session: Product Design for Remanufacturing	
	Chair(s): Serkan M. Akturk	

060-0282 Optimal Product Design in a Remanufacturing Setting

Serkan M. Akturk, Student, Texas A&M University College Station, United States

James Abbey, Assistant Professor, Texas A&M University College Station, United States

Neil Geismar, Associate Professor, Texas A&M University College Station, United States

Daniel Guide, Professor, Penn State University University Park, United States

This study analytically investigates how remanufacturing firms should choose among varying design philosophies ranging from integral to modular to part-based designs. Firms believe that increasing the level of remanufacturability would also increase the profitability by lowering remanufacturing costs. However, several factors such as industry clockspeed and time-to-market complicate this decision.

060-0087 Product Reuse in Industries with Radical Innovations

Tamer Boyaci, Professor, McGill University, Canada

Vedat Verter, Professor, McGill University, Canada

Michael Galbreth, Associate Professor, University of South Carolina, United States

We examine the effect of innovation on design for reusability and optimal reuse decisions. Our analytical model incorporates both incremental innovations, which are always occurring over time, and radical innovations, which occur probabilistically across the time horizon. The financial and environmental effects of these two types of innovation are discussed.

060-0956 Managing Engineering Design for Competitive Sourcing in Closed-loop Supply Chains

Tolga Aydinliyim, Assistant Professor, Baruch College, United States

Nagesh Murthy, Associate Professor, University of Oregon, United States

Using a game theoretical framework, we study the joint design and procurement decisions of a manufacturer who chooses between integral or modular design alternatives, and the pricing decisions made by its suppliers.

060-0646 Impacts of Supply Chain Strategies on Modular Product Designs in the Context of Reverse Logistics

Fuminori Toyasaki, Associate Professor, York University, Canada

Thomas Nowak, Student, Vienna University of Economics and Business, Austria

Tina Wakolbinger, Professor, Vienna Univ of Econ & Business Admin, Austria

Product modularity has been recognized as a promising way for mitigating negative product-related environmental effects. By combining producer and consumer effects of modular products, this study investigates the interrelationships between the supply chain strategy with a company's optimal product design decision and how this affects efficient reverse logistics decision making.

32	Friday, 10:00 AM - 11:30 AM, Columbia 3	Track: Empirical Research in Operations Management
	Session: Empirical Inventory Research	
	Chair(s): Shailesh Kulkarni Xianghui Peng	

- 060-1420** Hospital Centralized Inventory Practices - Impact of Demand Variability
Claudia Rosales, Assistant Professor, Michigan State University, United States

Hospitals usually centralize the storage and distribution of medical supplies. The efficiency of a centralized system can be affected by factors such as demand seasonality. We study the impact of demand seasonality in a centralized hospital supply chain and provide decision support systems to reduce its impact on inventory costs.

- 060-1664** The Antecedents and Consequences of Plant Closing Announcements
Bogdan Bichescu, Associate Professor, University of Tennessee Knoxville, United States
Amitabh Raturi, Professor, University of Cincinnati, United States

We leverage secondary data sources to identify antecedents and consequences of plant closures. The propensity for closure is found to depend on industry performance and a firm's size, age of capital, and profitability levels. We provide new evidence that large firms close plants first, while small firms wait longer.

- 060-1454** A Contingency Theory Perspective of Inventory as a Function of Process Types
Xianghui Peng, Student, University of North Texas, United States
Hakan Tarakci, Assistant Professor, University of North Texas, United States
Shailesh Kulkarni, Associate Professor, University of North Texas, United States
Victor Prybutok, Professor, University of North Texas, 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 from 1988 to 2012 in manufacturing industry sectors and the inventory decreasing rates are statistically different in terms of the manufacturing processes.

33	Friday, 10:00 AM - 11:30 AM, Columbia 4	Track: Empirical Research in Operations Management
	Session: Empirical Research Methodology	
	Chair(s): Andy Lahy	

- 060-1474** Production Practices and Competitiveness: Empirical Models of Two and Three Stage Least Squares
Cesar Ortega, Student, Universidad Nacional Autónoma de Honduras, Honduras
Maria Lopez, Student, Universidad Nacional Autónoma de Honduras, Honduras
Jose Machuca, Professor, Universidad De Sevilla, Spain

The objective of this paper is to share some interesting findings in order to have a more holistic view of fit for POM research by empirically testing, with an international survey (330 plants worldwide) and 2SLS and 3SLS models, complementarities among production practices in the search for higher competitiveness.

- 060-1490** Analysis of Measurement of Productivity and Competitiveness through Leontief and Cobb Douglas Mathematical Intersection Function
Mario Acevedo, Student, Universidad Nacional Autónoma de Honduras, Honduras
Cesar Ortega, Student, Universidad Nacional Autónoma de Honduras, Honduras

Global productivity and competitiveness indicators base their measurements on macro indicators making impossible to achieve a measurement between sectors. Therefore, this research try to establish an option to measure productivity and competitiveness over the intersection of Leontief and Cobb Douglas mathematical function, allowing a micro level rating companies.

- 060-1549** Structural Estimation of New Technology Diffusion
Sebastian Souyris, Student, University of Texas Austin, United States
Varun Rai, Assistant Professor, University of Texas Austin, United States

We study using micro level data the diffusion of residential solar panels by assuming that the adopters are rational, so they take optimal adoption decisions over time. We propose a structural model, where the households update their technology risk beliefs according to previous adoptions, which are spatio-temporal distributed. This contrasts with previous studies, which assume that the adoption decision is a function of covariates, including the installed base.

- 060-1645** Towards a Theory of Continuous Improvement
Pauline Found, Lecturer, University of Buckingham, United Kingdom
Andy Lahy, Student, University of Buckingham, United Kingdom

The term continuous improvement has been widely applied to OM but the meaning is ill defined and is used as a desired goal or as a means to achieve a goal. The purpose of this paper is to review the term continuous improvement with the aim of clarifying it's meaning

34	Friday, 10:00 AM - 11:30 AM, Columbia 9 <i>Session:</i> New developments in supply chain management <i>Chair(s):</i> Bin Hu	<i>Track:</i> Economics Models of Operations
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- 060-0151** Capacity Investment with Demand Learning
 Anyan Qi, Assistant Professor, University of Texas Dallas, United States
 Hyun-soo Ahn, Associate Professor, University of Michigan Ann Arbor, United States
 Amitabh Sinha, Assistant Professor, University of Michigan Ann Arbor, United States

We study a firm's strategy to adjust its capacity using information learned from observed demand. We characterize the firm's optimal policy and develop an easily-implementable and data-driven heuristic about when and by how much the firm should adjust its capacity. We also numerically validate the performance of our heuristic.

- 060-0231** Sharing Aggregate Inventory Information with Customers: Strategic Cross-selling and Shortage Reduction
 Ruomeng Cui, Assistant Professor, Indiana University Bloomington, United States
 Hyoduk Shin, Assistant Professor, University of California San Diego, United States

We study the inventory information sharing strategy of a firm selling differentiated products. The seller credibly and discretionarily discloses inventory information to customers either fully or partially, i.e., disclosing only the aggregate inventory level. We demonstrate that inventory information aggregation arises in order to cross-sell and reduce inventory shortages.

- 060-0245** Inducing Environmental Disclosure: A Dynamic Mechanism Design Approach
 Shouqiang Wang, Assistant Professor, Clemson University, United States
 Peng Sun, Associate Professor, Duke University Durham, United States
 Francis De Vericourt, Associate Professor, INSEAD, France

Rewarding a firm for voluntarily disclosing a privately observable stochastic environmental hazard can be an alternative regulatory instrument in addition to the traditional inspections. We find that the optimal dynamic regulation policy using these two instruments is featured by a cyclical structure, depends critically on the inspection accuracy.

- 060-1337** Dynamic Pricing and Replenishment with Customer Upgrades
 Oben Ceryan, Assistant Professor, Drexel University, United States
 Ozge Sahin, Associate Professor, Johns Hopkins University, United States
 Izak Duenyas, Professor, University of Michigan Ann Arbor, 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.

35	Friday, 10:00 AM - 11:30 AM, Columbia 10 <i>Session:</i> Managing Socially and Environmentally Responsible Supply Chains <i>Chair(s):</i> Tim Kraft Leon Valdes	<i>Track:</i> Sustainable Operations
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- 060-0094** Responsible Sourcing in Supply Chains
 Ruixue Guo, Student, Stanford University, United States
 Hau Lee, Professor, Stanford University, United States
 Robert Swinney, Associate Professor, Duke University Durham, United States

We analyze the sourcing decision of a buyer choosing between two supplier types: responsible suppliers are costly while risky suppliers are less expensive but may experience responsibility violations. We study consumer and operating conditions that dictate the optimal sourcing strategy of the firm.

- 060-0260** Extended Producer Responsibility (EPR) for Pharmaceuticals
 Isil Alev, Student, Georgia Institute of Technology, United States
 Atalay Atasü, Associate Professor, Georgia Institute of Technology, United States
 Ozlem Ergun, Associate Professor, Georgia Institute of Technology, United States
 Beril Toktay, Professor, Georgia Institute of Technology, United States

EPR-based policy has gained traction for managing pharmaceutical overage. In our work, we analyze its effectiveness by developing a game-theoretic model of pharmaceutical chain with a focus on factors causing overage. We uncover conditions for effective EPR implementation and critical factors determining stakeholder perspectives on EPR in the pharmaceuticals context.

- 060-0326** Improving Food Bank Gleaning Operations
 Xiaoli Fan, Student, Cornell University, United States
 Miguel Gomez, Associate Professor, Cornell University, United States
 Deishin Lee, Assistant Professor, Boston College, United States
 Erkut Sonmez, Assistant Professor, Boston College, United States

We develop a stochastic optimization model to help food banks improve their gleaning operations. Gleaning refers to collecting food from what is left in the fields after harvest, and donating the goods to food banks or pantries that service food insecure individuals.

060-0858 Transparency versus Imperfect Information in the Sustainable Supply Chain
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 invest to increase the transparency of his supply chain and the performance of his supplier. An NGO may communicate to consumers the true level of social responsibility, potentially decreasing profits.

36	Friday, 10:00 AM - 11:30 AM, Columbia 11	<i>Track:</i> Sustainable Operations
	<i>Session:</i> Sustainability Issues in Supply Chains	
	<i>Chair(s):</i> Lan Wang	

060-0126 Environmental Implications for Strategic Supply Chain Decisions: The Role of Scale and Technology
Nazli Turken, Assistant Professor, Cleveland State University, United States

We study the effects of different environmental regulations and penalties under strict liability and negligence on the facility location decisions of a firm. Instead of using mixed integer programming, we utilize continuous approximations to find the optimal green production technology and end-of-pipe emissions control investments.

060-0461 How Much Can Risk Preferences Rationalize Full Refund Policies?
Guangzhi Shang, Assistant Professor, Florida State University, United States
Lan Wang, Assistant Professor, California State University East Bay, United States

Theoretical models of retail return policies offer a general insight: partial refund is optimal. This theoretical prediction is in sharp contrast with the popularity of full refund policies in practice. We test whether risk preferences of consumers can offer a plausible reconciliation between theory and practice.

060-0626 Building Environmental Superiority: A Capability and Deficiency Analysis
Jeffery Smith, Associate Professor, Florida State University, United States
Hannah Stolze, Assistant Professor, Florida State University, United States
Andrew Sutton, Student, Florida State University, United States

Drawing on the theoretical concept of comparative advantage, this paper explores the actions a firm can take that impact environmental and financial performance. Specifically, we examine how a firm's capabilities and deficiencies affect environmental impact, reputation, and financial position. To test the proposed model, data from 204 firms were used.

060-0805 Design Implications of Extended Producer Responsibility: Durable or Recyclable Products?
Ximin (Natalie) Huang, Student, Georgia Institute of Technology, United States
Atalay Atas, Associate Professor, Georgia Institute of Technology, United States
Beril Toktay, Professor, Georgia Institute of Technology, United States

We consider a monopolist who has two product design options to manage the end-of-life costs/revenues associated with its products: making products more durable or recyclable. We explore how the recyclability and durability choices are affected by the requirements of take-back legislation.

38	Friday, 10:00 AM - 11:30 AM, Piscataway	<i>Track:</i> Inventory Management
	<i>Session:</i> multi-echelon/location/supplier inventory management	
	<i>Chair(s):</i> Xiting Gong	

060-0561 Dynamic Inventory Management with Total Minimum Commitments and Two Supply Options
Xiting Gong, Assistant Professor, The Chinese University of Hong Kong, Hong Kong
Tong Wang, Student, The Chinese University of Hong Kong, Hong Kong
Sean Zhou, Associate Professor, Chinese Univ of Hong Kong, Hong Kong

We study a dynamic inventory control problem for a firm who operates under a total minimum commitment (TMC) contract with two supply options. Under such a contract, the cumulative order quantity from either supply or from both supplies over a finite horizon must be at least as large as a given quantity. Using a decomposition technique and multimodularity, we characterize the firm's optimal inventory control policy under different TMC contracts.

060-0566 A New Approach to Two-location Joint Inventory and Transshipment Control via L-natural-Convexity
Xin Chen, Associate Professor, University of Illinois Urbana-Champaign, United States
Xiangyu Gao, Student, University of Illinois Urbana-Champaign, United States
Zhenyu Hu, Student, University of Illinois Urbana-Champaign, United States

We provide a new approach to the optimal joint inventory and transshipment control with uncertain capacities by employing the concept of L-Natural-Convexity, which significantly simplifies the analysis in the existing literature. Our approach uses variable transformation techniques and apply two recent preservation results of the L-Natural-convexity.

060-0798 A Two-echelon Inventory System with a Minimum Order Quantity Requirement
Han Zhu, Student, City University of Hong Kong, Hong Kong
Frank Chen, Professor, City University of Hong Kong, Hong Kong

We consider a one-warehouse-multi-retailer inventory system with the warehouse facing a minimum order quantity requirement. Using the position-based cost-accounting scheme to exactly evaluate the systemic cost, we obtain lower and upper bounds for policy optimization.

060-0925 Knowledge You Can Act On: Optimal Policies for Assembly Systems with Expediting and Advance Demand Information

Alexandar Angelus, Assistant Professor, University of Texas Dallas, United States

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

We consider a multi-period inventory model with an assembly structure and advance demand information. We allow regular and expedited replenishments of stock. We identify conditions that allow this assembly system to be reduced to an equivalent series system, and establish the optimal policy for the resulting multi-echelon series system.

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Friday, 10:00 AM - 11:30 AM, Cardozo

Track: Information in Operations Management

Session: Increasing Efficiency in Supply Chains

Chair(s): Yunxia Zhu

060-0068 Outpatient Appointment Scheduling Under Patient No-shows and Patient Heterogeneity

Seung Jun Lee, Student, Texas A&M University College Station, United States

Gregory Heim, Associate Professor, Texas A&M University College Station, United States

Chelliah Sriskandarajah, Professor, Texas A&M University College Station, United States

Yunxia Zhu, Assistant Professor, Rider University, United States

We consider an outpatient appointment scheduling system involving patient no-shows and patient heterogeneity to tackle healthcare process issues that suffer from inefficient performance and financial incentives. We evaluate and compare the performances of two proposed policies based on our block scheduling policy under various scenarios.

060-0532 Operations in Currency Supply Chain - A Review

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

We provide an overview of the research problems on currency supply chains. The structure of a general banknote supply chain is given before the discussion of the problems from three different aspects: the supply side, the demand side, and the third party logistics providers.

060-0539 Scheduling Robotic Cells: Optimization over 1-Unit Cycles

Kyung Sung Jung, Lecturer, Warrington College of Business Administration, United States

Neil Geismar, Associate Professor, Texas A&M University College Station, United States

Michael Pinedo, Professor, New York University, United States

Chelliah Sriskandarajah, Professor, Texas A&M University College Station, United States

For buffer-less robotic cells producing identical parts under the free-pickup criterion, we study the problem of finding optimal 1-unit cyclic sequences of robot moves that maximize the throughput. We show that some cases/conditions are NP-hard, and the others are polynomial solvable. Our theoretical studies provide managerial insights for scheduling operations.

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Friday, 10:00 AM - 11:30 AM, Du Pont

Track: Humanitarian and Not-for-profit Operations

Session: Humanitarian Operations

Chair(s): Nezh Altay

060-0647 Strategic Allocation of Medical Surplus

Wee Meng Yeo, Lecturer, Georgia Institute of Technology, United States

Atalay Atas, Associate Professor, Georgia Institute of Technology, United States

Beril Toktay, Professor, Georgia Institute of Technology, United States

Inspired by a Medical Surplus Recovery Organization (MSRO) that bridges the gap between medical surplus and needs of under-served hospitals in the developing world, we analytically investigate the efficiency of adopting a recipient-driven resource allocation model, implications of which are then tested and validated using real-life data.

060-0675 The Role of Media Exposure in Humanitarian Coordination

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

Hongmin Li, Associate Professor, Arizona State University Tempe, United States

Despite their resource limitations and the considerable level of demand for humanitarian actions, humanitarian organizations typically do not coordinate in the field. Considering the impact of media exposure, our study unveils the conditions in which humanitarians will coordinate. This paper contains both empirical study and analytical modeling.

060-1430 Forecasting and Prepositioning of Emergency Food Relief: Ramping up in Preparation for Disasters

Nezh Altay, Associate Professor, Depaul University, United States

The purpose of this study is to investigate the ramp-up process in response to a disaster, during which humanitarian relief organizations have to switch from an efficient supply chain design to a responsive one, over a very short period of time, to serve the affected people.

060-0664 "Service Triads" in Humanitarian Operations

Graham Heaslip, Associate Professor, The University of New South Wales, Australia

Service triads, in which a buyer contracts with a supplier to deliver services directly to the buyer's customer, represent an emerging business model. Service triads entail a structure of inter-organizational relationships that is fundamentally different to that encountered in linear supply chains. This research examines service triads in humanitarian operations.

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Friday, 10:00 AM - 11:30 AM, Embassy

Track: Sustainable Operations

Session: Study Frameworks of Sustainability

Chair(s): Sergio Gouvea da Costa

060-1539 Proposal of a Method for Review and Content Analysis of Literature: The Case of Industrial Energy Efficiency

Marcos Perroni, Student, Pontifical Catholic University of Parana, Brazil

Sergio Gouvea da Costa, Associate Professor, Pontifical Catholic University of Parana, Brazil

Edson Pinheiro de Lima, Associate Professor, Pontifical Catholic University of Parana, Brazil

Wesley da Silva, Professor, Pontifical Catholic University of Parana, Brazil

Dilmeire Vosgerau, Associate Professor, Pontifical Catholic University of Parana, Brazil

This paper aims to develop a method integrating techniques: Content Analysis, Bibliometric Analysis, Social Network Analysis and Concept Mapping in a Systematic Literature Review Environment. The application of the method will occur in the area of Industrial Energy Efficiency. This paper hopes to contribute with the field of Research Methodology.

060-0903 A Research Framework for Sustainable Supply Chain Management

Norma Harrison, Professor, Macquarie University, Australia

Tayyab Amjed, Student, Macquarie University, Australia

Sustainable supply chain management (SSCM) requires thorough social, economic and environmental practices. A first step towards this end is the development of a holistic 'research framework' that can guide the research process. This paper develops the framework by using academic literature; current SSCM definitions; relevant theories; and experts' feedback.

060-0057 A Heuristic Approach for Disassemble-to-Order Problem under Binomial Yields

Karl Inderfurth, Professor, Universitaet Magdeburg, Germany

Sandra Transchel, Associate Professor, Kuehne Logistics University, Germany

Stephanie Vogelgesang, Student, Universitaet Magdeburg, Germany

Ian Langella, Associate Professor, Shippensburg University, United States

In disassemble-to-order systems randomness of recoverable parts gained from used products creates a challenge for planning. Although heuristics have been developed for stochastically proportional yields, this has not been the case for binomial yields. We present a decomposition-based heuristic approach that can be applied to problems of arbitrary size.

060-1603 Lean To Green Manufacturing: A Conceptual Framework

Shirish Sangle, Associate Professor, National Institute of Industrial Engineering, Mumbai, India

Milind Akrate, Associate Professor, National Institute of Industrial Engineering, Mumbai, India

Sustainability is an important requirement for competitiveness. Lean practices not only gives competitiveness but also helps improve sustainability. However, the impact of lean on environment (how much lean is green) is being investigated by researchers. Green manufacturing practices are reviewed and a conceptual framework to analysis is presented.

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Friday, 10:00 AM - 11:30 AM, Fairchild East

Track: Healthcare Operations Management

Session: Kidney exchange

Chair(s): Itai Ashlagi

060-0850 The Dynamics of Kidney Exchange

John Dickerson, Student, Carnegie Mellon University, United States

Tuomas Sandholm, Professor, Carnegie Mellon University, United States

We discuss analytic, optimization, and game-theoretic approaches to matching in dynamic kidney exchange. We consider dynamism (i) at the post-match pre-transplant stage (ii) as patients and donors arrive and depart over time, and (iii) as multiple exchanges compete for overlapping sets of participants.

060-0904 International Kidney Exchange

Afshin Nikzad, Student, Stanford University, United States

Many end-stage renal disease (ESRD) patients in underdeveloped countries die after a few weeks of diagnosis, even if they have a compatible living donor, because of high transplant and maintenance therapy costs. We study two international kidney exchange proposals under which a sponsoring country finances the patients in underdeveloped countries.

060-1078 A Non-asymptotic Approach to Analyzing Kidney Exchange

Yichuan Ding, Assistant Professor, Univ of British Columbia, Canada

Dongdong Ge, Professor, Shanghai Jiao Tong University, China

Simai He, Professor, Shanghai University of Finance and economics, China

Christopher Ryan, Assistant Professor, Univ of Chicago, United States

We study kidney exchange problem in this project. We present a framework for non-asymptotic analysis of kidney exchange graph. We also propose a simple matching algorithm based on random walk with guaranteed performance.

060-1433 Modeling High Sensitization in Kidney Exchange Programs

Maximilien Burq, Student, Massachusetts Institute of Technology, United States

Kidney exchange programs face growing number of highly sensitized patients. We develop an online model that models sensitization, and we prove that having some easy-to-match patients in the pool greatly reduces waiting times and the length of chains. We provide simulations showing that some prioritizing leads to improved overall efficiency.

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Friday, 10:00 AM - 11:30 AM, Fairchild West

Track: Healthcare Operations Management

Session: Surgical Planning and Operating Rooms Management

Chair(s): Vikram Tiwari

060-0720 On Coordinating Anesthesiology and Internal Medicine in a Patient-centered Surgical Home

Douglas Morrice, Professor, University of Texas Austin, United States

Dongyang (Ester) Wang, Student, University of Texas Austin, United States

Kumar Muthuraman, Associate Professor, University of Texas Austin, United States

Jonathan Bard, Professor, University of Texas Austin, United States

Luci Leykum, Professor, University of Texas Health Sciences Center, San Antonio, United States

Susan Noorily, Professor, University of Texas Health Sciences Center, San Antonio, United States

In this paper, we consider different levels of coordination of Anesthesia and Internal Medicine services through patient scheduling in a Patient-Centered Surgical Home. Our work is motivated by a study conducted at the University of Texas Health Sciences Center, San Antonio and its affiliated teaching hospital.

060-0940 Flexible Hospital-wide Elective Patient Scheduling

Daniel Gartner, Student, Carnegie Mellon University, United States

Rainer Kolisch, Professor, Technische Universität München, Germany

Rema Padman, Professor, Carnegie Mellon University, United States

We consider a contribution margin-maximizing patient scheduling problem with features such as flexible admission decisions, overtime, specialty assignment and surgical team assignment. Our mathematical program is embedded in a rolling horizon planning framework to evaluate uncertainty. We show to what extent overtime and uncertainty impacts economic and patient-related measures.

060-1521 A Novel Approach for Operating Room Scheduling

Panos Kougiass, Associate Professor, Baylor University, United States

Optimizing productivity of the operating room (OR) of a hospital is crucial for financial and medical purposes. We present a novel OR scheduling methodology that is based on individual surgery length prediction using a regression system that has been shown in simulation to improve throughput and reduce overtime

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Friday, 10:00 AM - 11:30 AM, Gunston East

Track: Global Operational Issues

Session: Non-profit and Humanitarian Operations

Chair(s): Milind Sohoni

060-0266 Improving Societal Outcomes in the Organ Donation Value Chain

Priyank Arora, Student, Georgia Institute of Technology, United States

Ravi Subramanian, Associate Professor, Georgia Institute of Technology, United States

We study operational actions of supply-side players in an organ donation value chain (ODVC), namely, the Organ Procurement Organization that coordinates organ recovery activities, and the hospital where potential cadaveric donors arrive. To our knowledge, the coordination of supply-side ODVC actions to improve societal outcomes has not been studied before.

060-0705 Signaling Operational Efficiency in Non-profit Markets

Sripad Devalkar, Assistant Professor, Indian School of Business, India

Milind Sohoni, Associate Professor, Indian School of Business, India

A common concern with non-profit markets is the lack of credible information about the operational efficiency of a non-profit organization (NPO). We study a model where a NPO chooses to deliver benefits in order to signal efficiency before seeking funds from donors and quantify the value of such signaling.

060-1635 Understanding Farmers' Decisions on Crop Diversification and Use of Groundwater for Irrigation

Bharat Ramaswamy, Professor, ISI Delhi, India

Sridhar Seshadri, Professor, Indian School of Business, India

Sripad Devalkar, Assistant Professor, Indian School of Business, India

Cultivation of high yield varieties of rice-wheat crops has led to depletion of groundwater-tables and soil-fertility in India. We identify major factors, including risk aversion, supply chain, labor and credit, that affect the farmers' decision not to diversify to alternative crops that are beneficial to the farmer and the environment.

45	Friday, 10:00 AM - 11:30 AM, Gunston West	<i>Track:</i> Marketing and OM Interface
	<i>Session:</i> Integration of Marketing and OM: Theory, Application, and Teaching	
	<i>Chair(s):</i> Gang Li	

- 060-0149** Market Competition and Segmentation with Green Product Introduction
Yu Xia, Associate Professor, Northeastern University, United States
Chialin Chen, Associate Professor, Queens University, Canada
Vaidy Jayaraman, Associate Professor, University of Miami, United States

We study how suppliers compete in the market and segment the market with the introduction of green products. Two brands with different traditional technology and green technology level are considered. Situations that both brands belong to one supplier and both brands belong to different suppliers are investigated.

- 060-0394** Strategic Role of Retailer Bundling in a Distribution Channel
Qingning Cao, Student, Vanderbilt University, United States
Xianjun Geng, Associate Professor, University of Texas Dallas, United States
Jun Zhang, Professor, Fudan University, China

We study retailer bundling in a distribution channel when the manufacturer for one bundled product can strategically set the wholesale price. We show that the retailer can use a bundling option as a strategic leverage to extract concessions from the manufacturer in form of a lower wholesale price.

- 060-0445** From Used to New: Increasing Profit through Product Renewals
Michael Pangburn, Associate Professor, University of Oregon, United States
Euthemia Stavoulaki, Associate Professor, Bentley University, United States

Product deterioration can benefit a manufacturer by driving repeat sales. Although planned obsolescence is an established strategy, some firms promote product longevity by offering a product renewal service. By committing to a price for its refresh service, we show that renewals can increase revenues sufficiently to offset the additional expense.

- 060-0717** Coordination of Telecommunication Service Supply Chain under Network Externalities
Jun Wu, Professor, Beijing University of Chemical Technology, China

We study the coordination issues in a telecom service chain with network externalities. First, a business model of telecom service supply chain with one telecom operator and one service provider is established. Second, pricing and profit sharing mechanism in the perspective of non-cooperative game and cooperative game are analysed.

46	Friday, 10:00 AM - 11:30 AM, Coats	<i>Track:</i> Retail Operations Management
	<i>Session:</i> New Applications in Retail Operations	
	<i>Chair(s):</i> Mehmet Altug	

- 060-0065** Omnichannel Inventory Management with Buy-online-and-Pickup-in-Store
Fei Gao, Student, University of Pennsylvania, United States
Xuanming Su, Associate Professor, University of Pennsylvania, United States

Many retailers offer customers the option to buy online and pickup in store. We study the impact of this new initiative on inventory management in both online and offline channels. We identify situations when this initiative may hurt profits and offer recommendations to retailers.

- 060-0464** Effectiveness of Targeted Return Management on Retailer's Profitability
Mehmet Altug, Assistant Professor, George Washington University, United States
Tolga Aydinliyim, Assistant Professor, Baruch College, United States

As retailers offer more lenient return policies, customer abuse and fraudulent returns are also on the rise. To combat that, instead of changing return policies for everyone, retailers started to identify those "bad" customers. In a two-period framework, we study the impact of selectively changing return policies on retailer's profit.

- 060-0890** Selling to a Competing Buyer with Limited Supplier Capacity
Zhibin (Ben) Yang, Assistant Professor, University of Oregon, United States
Xinxin Hu, Assistant Professor, Indiana University, United States
Haresh Gurnani, Professor, University of Miami, United States
Huiqi Guan, Student, University of Miami, United States

We explore effect of limited capacity on the supplier's channel strategy: being supplier only, being solo seller, or dual channel. We characterize equilibrium channel strategy, ordering and selling decisions. We find that moderate capacity benefits the supplier, buyer and the consumer simultaneously and that the buyer may withhold supply.

- 060-0918** Should Price/Promotions/Displays Be Customized at the Store Level?
Mark Ferguson, Professor, University of South Carolina, United States
Olga Pak, Student, University of South Carolina, United States

There is evidence that customers are heterogeneous between store locations. In joint work with Oracle Retail, we estimate hierarchical models on retail transaction data across multiple market and store locations to identify the influence of the individual store effect on product demand.

47	Friday, 10:00 AM - 11:30 AM, Monroe	<i>Track:</i> Product Innovation and Technology Management
	<i>Session:</i> Product and Process Innovation in the Health Care Supply Chain	
	<i>Chair(s):</i> Luv Sharma	

060-0543 Patient, Heal Thyself! A Technology Enabled Intervention to Promote Patient Activation

Carrie Queenan, Assistant Professor, University of South Carolina, United States

Chronic disease costs are soaring and in many cases, patients have significant control over their health condition. We propose that telemonitoring with nurse interaction can improve patient activation and reduce hospitals readmissions, thereby reducing costs. We present results of a randomized experiment showing support of our telemonitoring intervention.

060-0833 Learning from Failures of High Tech Innovation in Medical Device Industry

Ujjal Mukherjee, Student, Twin-Cities, United States

Kingshuk Sinha, Professor, University of Minnesota, United States

We investigate if firms learn from past failure experience in medical device industry. Also, we find out firm and product related conditions under which firms learn more/less and thereby influence future failure likelihood. This research would help firms understand their innovation and innovation management process better and thereby improve.

060-1562 IT-leveraging Capability for Reducing Health Care Disparities: An Empirical Analysis of Primary Care Operations

David Zepeda, Assistant Professor, Northeastern University, United States

Kingshuk Sinha, Professor, University of Minnesota, United States

The study investigated the role of IT in reducing health care disparities. Using clinic level data from 450 clinics in the Midwest, this study evaluates the effects of resource dependence, IT leveraging capability, and affordability on the delivery of high quality diabetes care.

060-0122 The Impact of Hospital Information Technology Adoption Process on Quality of Care

Luv Sharma, Student, Ohio State University, United States

Aravind Chandrasekaran, Assistant Professor, Ohio State University, United States

This paper looks at the process of adoption of Health Information Technologies (HIT) for 1100 hospitals to identify an ideal implementation strategy. We define process of adoption in terms of sequence, intensity and complexity of adopted HITs. Results demonstrate an ideal sequence whose benefits depend on the intensity of adoption.

48	Friday, 10:00 AM - 11:30 AM, Holmead East	<i>Track:</i> Service Operations
	<i>Session:</i> Hospitality Operations	
	<i>Chair(s):</i> Rohit Verma	

060-0668 Technology-based Innovations in Upscale and Luxury Hotels

Spring Han, Assistant Professor, National Research University, Higher School of Economics, Russian Federation

Rohit Verma, Professor, Cornell University, United States

Find out how today's upscale and luxury hotels are leveraging technology-based innovations to personalize their guest's experiences. This paper presents the results of the latest survey of luxury hotel executives and customers, that compares the relative usefulness of different types of technologies for enhancing guest satisfaction

060-0674 Leveraging On-line Text Reviews in Managing Hotel Operations

Joel Goh, Assistant Professor, Harvard University, United States

Spring Han, Assistant Professor, Higher School of Economics, Russian Federation

Shawn Mankad, Assistant Professor, University of Maryland, United States

Srinagesh Gavirneni, Associate Professor, Cornell University, United States

Rohit Verma, Professor, Cornell University, United States

User Generated Content (on-line reviews) is a major source of information to the hotel industry. Using tools from natural language processing, specifically sentiment analysis, reading level estimation, and topic modeling, we demonstrate how these text reviews can be used, in conjunction with the traditional numerical ratings, to improve hotel operations.

060-1413 Case Study: Oberoi Hotels

Ryan Buell, Professor, Harvard University, United States

Ananth Raman, Professor, Harvard University, United States

Celebrated as one of the world's premiere luxury hotel brands, Oberoi attracts and serves some of the most quality sensitive customers on the planet. This case study explores how an organization can repeatedly delight such demanding customers, despite the fact that their expectations are growing with every visit.

49	Friday, 10:00 AM - 11:30 AM, Holmead West	<i>Track:</i> Service Operations
	<i>Session:</i> Service Management in Developing Countries	
	<i>Chair(s):</i> Milton Farina	

060-0456 From UBER to River Boat: A Relationship between Regulations and Service Quality in Thailand Tourism Industry

Praowpan Tansitpong, Lecturer, Mahidol University International College, Thailand

Chorthip Toworakajonkun, Student, Mahidol University International College, Thailand

Service providers juggle quality priorities to sustain profits and to comply with standards set by regulators. This study examines transportation modes in Thailand and suggest that price is not the only determinant on service quality but regulated standards play important role to maximize benefits of social welfare.

060-1590 Service Quality and Customer Satisfaction: Empirical Study in Vietnamese Tourism

Anh Phan, Lecturer, Vietnam National University, Hanoi, Vietnam, Vietnam

Ha Nguyen, Lecturer, Vietnam National University, Hanoi, Vietnam, Vietnam

Minh Nguyen, Lecturer, Vietnam National University, Hanoi, Vietnam, Vietnam

Yoshiki Matsui, Professor, Yokohama National University, Japan

This study empirically investigates the relationship between service quality and customer satisfaction in Vietnamese tourism. Statistical techniques are applied to analyze the data collected from 1200 tourism in 2014 and the results reveal that the empathy and responsiveness significantly impact the degree of customer satisfaction

060-0756 Information Diffusion Process in a Brazilian Corporate Travel Agency

Mark Tunu, Student, USCS, Brazil

Antonio Silva, Student, Universidade De Sao Paulo, Brazil

Davis Alves, Student, UNIP, Brazil

Milton Farina, Professor, USCS, Brazil

Ana Faria, Professor, Universidade Nove De Julho, Brazil

A considerable number of investigations during the past two decades of XXI Century have been widely recognised a growing interest in business travel all over the world. In accordance with this tendency, this research describes the information interaction process between the main stakeholders of a Brazilian Corporate Travel Agency.

060-0672 Performance of Office-based versus Home-based Call Center Agents: Evidence from Three Industries in Korea

Hyojeong Kim, Lecturer, University of Oregon, United States

Nagesh Murthy, Associate Professor, University of Oregon, United States

We examine the performance of call center agents that work from office vis-à-vis those that work from home. The home-based workers achieve significantly higher call productivity without any loss of call service quality. These differences are accentuated by task complexity and call routing clarity perceived by the agents.

060-0764 Corporate Business Traveling Service: Successful Factors

Milton Farina, Professor, USCS, Brazil

Mark Tunu, Student, USCS, Brazil

Antonio Silva, Student, Universidade De Sao Paulo, Brazil

Corporate business traveling plays a major part in travel agency all over the world. This research was conducted in an attempt to identify the main successful factors in accordance with the customer corporate business traveling perspective, in a Brazilian Corporate Travel Agency, to meet his/her needs and expectations.

50	Friday, 10:00 AM - 11:30 AM, Kalorama	Track: Supply Chain Management
	Session: Supply and Service Contracting	
	Chair(s): Tinglong Dai	

060-1400 Lead Times in Screening Contracts

Chester Chambers, Assistant Professor, Johns Hopkins University, United States

Eli Snir, Lecturer, Washington University St Louis, United States

This work looks at the value of adding lead time as a contract element when supply chain partners have asymmetric information about consumer demand and the resulting demand forecasts evolve stochastically. Contracts include fixed costs, variable costs and lead times.

060-1503 Contracting in Medical Equipment Maintenance Services: An Empirical Investigation

Tian Chan, Student, INSEAD, Singapore

Omar Besbes, Assistant Professor, Columbia University, United States

Francis De Vericourt, Associate Professor, INSEAD, France

Fixed-fee and pay-per-service contracts are two forms of maintenance service plans that structure payment between operators and service providers. Using data from 712 medical scanners, we empirically compare their effects on service outcomes and exploit a warranty period to isolate incentive effects from adverse selection.

060-0651 Personal Selling in Emerging Markets

Tinglong Dai, Assistant Professor, The Johns Hopkins University, United States

Jian Ni, Assistant Professor, The Johns Hopkins University, United States

We develop a principal-agent type model to study how a multinational manufacturer constructs its personal-selling networks when entering an emerging market. Our paper helps explain asymmetric distribution structures empirically observed in emerging markets.

51	Friday, 10:00 AM - 11:30 AM, Jay	<i>Track:</i> Supply Chain Management
	<i>Session:</i> Pharmaceutical and health supply chains	
	<i>Chair(s):</i> Hui Zhao	

060-0556 Recruitment Stocking Processes

Anh Ninh, Student, Rutgers University, United States

Benjamin Melamed, Professor, Rutgers University, United States

Yao Zhao, Associate Professor, Rutgers University, United States

We define a general class of inventory control problems - the recruitment stocking problems (RSP), where one needs to recruit a target number of subjects through multiple locations. These problems can be found in clinical trials, marketing research, etc. We provide a mathematical characterisation of RSP and its performance metrics.

060-1151 Gatekeeper or Roadblock: Optimizing Evidence Generation and Access to New Drugs

Liang Xu, Student, PhD student at Smeal, United States

Hui Zhao, Assistant Professor, Penn State University University Park, United States

Rocketing R&D cost implies unprecedented crisis in drug innovation. FDA instituted accelerated approval pathway to address the situation by allowing drug approval with reduced pre-market trials but enhanced post-market surveillance. Unfortunately, such purpose was largely failed. We analyze the tradeoff between evidence generation and access and propose three remedial mechanisms.

060-1216 Mitigating the U.S. Drug Shortages: Pareto-improving Contract Design

Justin Jia, Assistant Professor, Purdue University, United States

Hui Zhao, Assistant Professor, Penn State University University Park, United States

Drug shortages has been the most challenging problems facing the pharmaceutical industry. In this study, we model the drug supply chain pertaining to shortages and propose Pareto-improving contracts that mitigate drug shortages, improve drug manufacturer's profit, and cut government spending. We also test the proposal with realistic industry data.

060-1283 Fast to Respond or Slow to Learn: An Empirical Examination of the Recall Responsiveness Dilemma

George Ball, Student, University of Minnesota, United States

Rachna Shah, Associate Professor, University of Minnesota, United States

Product Recalls move through multiple decision steps owned by manufacturers and regulators. Using a 10-year panel of over 4,000 medical device recalls, we investigate the causes and effects of fast reaction time in the product recall process. Our findings indicate that firms should open recalls quickly but close recalls slowly.

52	Friday, 10:00 AM - 11:30 AM, Morgan	<i>Track:</i> Supply Chain Management
	<i>Session:</i> Supply Chain Coordination 2	
	<i>Chair(s):</i> Ahmad Bajwa	

060-0593 Supplier Incentives under Involvement of Parallel Teams

Timofey Shalpegin, Student, Hec Paris, France

Svenja Sommer, Associate Professor, Hec Paris, France

We study the influence of parallel teams developing the same product on the suppliers' incentives to exert efforts to develop a component for the product. We show that the supplier's optimal effort may increase when the other suppliers receive more teams to work with, i.e., the competition intensifies.

060-1615 Design Outsourcing in Fashion Supply Chain

Bin Shen, Lecturer, Donghua University, China

Qingying Li, Lecturer, Donghua University, China

Design innovation is the engine of fashion. Many fashion firms outsource design innovation to their suppliers. Design outsourcing is on the rise in fashion supply chain, but the research in this area lags behind industry practice. In this paper, we examine how design outsourcing affects supply chain.

060-0140 Enablers and Inhibitors of Collaborative Supply Chains: A Literature Review and Research Agenda

Sam Solaimani, Assistant Professor, Center for Marketing & Supply Chain Management, Netherlands

Erdogan Gülyaz, Student, Center for Marketing & Supply Chain Management, Netherlands

Jack van der Veen, Professor, Center for Marketing & Supply Chain Management, Netherlands

Venu Venugopal, Professor, Center for Marketing & Supply Chain Management, Netherlands

While the merits of Collaborative Supply Chains (CSCs) are broadly appreciated, studies on sine-qua-nons in the formation of CSC are relatively limited. This paper systematically reviews the extensive CSC literature to extract critical success factors and challenges, and proposes a generic framework to establish and sustain various levels of CSCs.

060-0229 Using Price Discrimination in an Integrated Supply Chain

Ahmad Bajwa, Assistant Professor, University of Arkansas, United States

Rafay Ishfaq, Assistant Professor, Auburn University, United States

In this research we study an integrated supply chain with online and physical distribution channels. We study the effect of price discrimination across channels of distribution and how firms can maximize profit by integrating pricing and logistics decisions. We use sales/inventory data from a leading retailer and solve numerical problems.

53	Friday, 10:00 AM - 11:30 AM, Northwest	<i>Track:</i> Revenue Management and Pricing
	<i>Session:</i> Pricing and Mechanism Design	
	<i>Chair(s):</i> Ozan Candogan	

- 060-0524** Dynamic Pricing for Customers with Heterogeneous Valuation Decay
Negin Golrezaei, Student, University of Southern California, United States
Hamid Nazerzadeh, Assistant Professor, University of Southern California, United States
Ramandeep Randhawa, Assistant Professor, University of Southern California, United States

We characterize the optimal mechanism for selling durable goods when customers are heterogeneous with respect to both their initial valuations and their valuation decay rate, which represents the value lost due to delay in the purchase. We show that delayed allocation can be an effective screening tool for maximizing revenue.

- 060-0803** Assortment Planning and Pricing with Search Cost
Ozge Sahin, Associate Professor, Johns Hopkins University, United States
Ruxian Wang, Student, Johns Hopkins University, United States

We consider assortment planning and pricing problems in the presence of consumer search cost. We show that the assortment problem with given prices is NP-hard and can be solved by dynamic programming. We also study the pricing problem with search cost for a monopolist and in competition.

- 060-1604** Designing Dynamic Contests
Kostas Bimpikis, Assistant Professor, Stanford University, United States
Shayan Ehsani, Student, Stanford University, United States
Mohamed Mostagir, Assistant Professor, University of Michigan Ann Arbor, United States

Tournaments are suited for settings that feature a high degree of uncertainty. Participants learn about the underlying environment from their competitors' progress. Also, information about the status of competition may adversely affect effort provision from the laggards. We suggest the optimum design with the objective of maximizing reaching end goal.

- 060-1102** Optimal Contracts for Intermediaries in Online Advertising
Ozan Candogan, Assistant Professor, Fuqua school of business, United States
Santiago Balseiro, Assistant Professor, Fuqua school of business, United States

In online display advertising, the prevalent method advertisers employ to acquire impressions is to contract with an intermediary. We formulate the contract design problem as a mechanism design problem, in a setting where advertisers' budgets and targeting criteria are private. Using a novel performance-space characterization, we provide the optimal contract.

54	Friday, 10:00 AM - 11:30 AM, Oak Lawn	<i>Track:</i> Risk Management in Operations
	<i>Session:</i> Empirical Supply Chain Research 2	
	<i>Chair(s):</i> Nikolay Osadchiy Jun Li	

- 060-0272** Supply Chain Network Structure and Firm Returns
Jing Wu, Student, University of Chicago, United States
John Birge, Professor, University of Chicago, United States

Supply chain relationships is closely related to firm returns in both the first order effect of direct propagation and the second order effect of systematic risk exposure. We propose models to study such effects and provide empirical evidences.

- 060-0402** Impact of Supply Relationship Dynamics on Firm Performance: A Multilevel Empirical Analysis
Marcus Bellamy, Student, Georgia Institute of Technology, United States
Soumen Ghosh, Professor, Georgia Institute of Technology, United States
Manpreet Hora, Assistant Professor, Georgia Institute of Technology, United States

We develop an empirical model based on a large-scale supply chain relationship dataset to examine supply relationship dynamics as drivers of firm performance. Our unique dataset allows us to investigate manufacturing firms both as customers and suppliers. We use a multilevel mixed-effects model combining firm and dyad level effects.

- 060-1104** Global Sourcing: Impact of Sourcing Strategies on Supply Chain Resilience
Nitish Jain, Assistant Professor, London Business School, United Kingdom
Karan Girotra, Assistant Professor, INSEAD, France
Serguei Netessine, Professor, INSEAD, Singapore

Firms sourcing from global suppliers are vulnerable to many kinds of disruptions. Resilient supply chains can help firms to mitigate negative financial consequences of these disruptions. In this study, we use ship manifest data to study the impact of supply chain structure upon resilience of global supply chains.

- 060-1335** Systematic Risk in Supply Chain Networks

Friday, 10:00 AM - 11:30 AM

Nikolay Osadchiy, Assistant Professor, Emory University, United States

Vishal Gaur, Professor, Cornell University, United States

Sridhar Seshadri, Professor, Indian School of Business, India

We investigate how systematic risk propagates through a supply network using industry- and firm-level supply chain maps. We identify three drivers of systematic risk: production decisions, aggregation over customer-base, and aggregation over time.

56	Friday, 10:00 AM - 11:30 AM, Parlor A	Track: General Track
	Session: Logistics Optimization	
	Chair(s): Heng Chen	

060-0912 Wind Driven Optimization Algorithm for TSP

Wanxi Li, Assistant Professor, Radford University, United States

A novel wind-driven optimization (WDO) based algorithm is presented for solving traveling salesman problem. A random swap technique is used for local search to improve the performance. The solution performance is compared with particle swarm optimization algorithm, which is effective according to previous studies.

060-0924 Branch-and-Price-and-Cut for the Combined Combinational Auction and Vehicle Routing Problem with Time Windows

Zhenzhen Zhang, Student, City University of Hong Kong, Hong Kong

Andrew Lim, Professor, City University of Hong Kong, Hong Kong

This CAVRPTW was faced by China National Petroleum Corporation (CNPC) who needs to select bids provided by the third-party logistics companies and design routes for remain customers. We propose an exact branch-and-price-and-cut method to solve it. We also introduce the new test data for future studies.

060-1418 Minimizing Airline Delays through Improved Airport Departure Operations

Heng Chen, Student, University of Massachusetts Amherst, United States

Senay Solak, Assistant Professor, University of Massachusetts Amherst, United States

Metering policies during airport departure operations can reduce airport delays and improve fuel efficiency for airlines. We describe a stochastic dynamic programming framework to identify the optimal departure metering policies to minimize expected overall costs associated with delay. Potential fuel benefits are indicated for representative airports and airlines.

57	Friday, 10:00 AM - 11:30 AM, Parlor B	Track: Purchasing and Supply Management
	Session: Outsourcing and Supply Management	
	Chair(s): Kalinga Jagoda	

060-1591 Beyond Outsourcing: Managing Supply Chain in the Residential Construction Industry

Kalinga Jagoda, Associate Professor, Mount Royal University, Canada

Liam Roebuck, Student, Mount Royal University, Canada

Recent developments in information technology and logistics have provided the managers an array of options in outsourcing parts of the supply chain that have traditionally been performed in-house. By using the stage-gate approach, this paper presents an integrated model of selecting and managing outsourcing activities in the residential construction industry.

060-1578 Multi Criteria Based Supply Classification Using Kraljic Matrix

Milind Akarte, Associate Professor, National Institute of Industrial Engineering, Mumbai, India

Vivekanand Khanapuri, Professor, National Institute of Industrial Engineering, Mumbai, India

Supply management controls 50% of cost of product. Supply strategies using Kraljic framework for supply classification and development of strategies is subjective making it difficult for taking decisions. Using AHP, supply items are classified using objective evaluation related to importance of purchasing and complexity of supply & improve decision making.

060-1062 Buyer Performance Evaluation from Suppliers Perspectives: An Integrated Fuzzy AHP and Fuzzy DEMATEL Approach

Purushottam Meena, Assistant Professor, New York Institute of Technology, United States

Rajen Tibrewala, Professor, New York Institute of Technology, United States

Gopal Kumar, Senior Lecturer, Dublin City University, Ireland

Pothiraj Srinath, Student, New York Institute of Technology, United States

This study use a combination of fuzzy Analytic Hierarchy Process (AHP) and fuzzy Decision-making Trial and Evaluation Laboratory (DEMATEL) method for measuring the buyer performance from suppliers' perspectives. First, we use AHP to evaluate all criterion weighting and then used DEMATEL to establish contextual relationships among those criteria.

060-0872 Investigation of Supply Chain Governance Mechanisms in the Manufacturing Industry

Nisha Kulangara, Student, University of Texas Arlington, United States

Edmund Prater, Associate Professor, University of Texas Arlington, United States

Markus Biehl, Associate Professor, York University, Canada

Gregory Frazier, Professor, University of Texas Arlington, United States

The specific purpose of this study is to assess how firms engaged in an outsourcing relationships can execute effective governance mechanisms to mitigate risks associated with post contractual opportunistic behavior. With increasing levels of globalization, this study investigates how firms from different cultures respond to these control mechanisms.

060-1515 Outsourcing Procurement: Analysis of Critical Success Factors in EPC Projects

Ege Kardele, Student, Mount Royal University, Canada

Kalinga Jagoda, Associate Professor, Mount Royal University, Canada

In recent years, it has become increasingly popular to outsource procurement activities of EPC projects to outside contractors to reduce costs while completing projects faster. This paper examines the critical success and failure factors of strategic sourcing decisions related to EPC projects in the Canadian oil and Gas sector.

59	Friday, 01:30 PM - 03:00 PM, Columbia 1 <i>Session:</i> Joint Session: BIOM and Retail Operations <i>Chair(s):</i> Nathan Craig	<i>Track:</i> Behavior in Operations Management
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- 060-0642** The Costs of Behavioral Ordering: Inventory, Competition and Policy
 Bernardo Quiroga, Student, Penn State University University Park, United States
 Brent Moritz, Assistant Professor, Penn State University University Park, United States
 Anton Ovchinnikov, Associate Professor, Queens University, Canada

We investigate the effect how much profit a newsvendor-type decision maker loses due to behavioral (intuitive but suboptimal) ordering under competition. We consider several competitor policies, and find substantial average profit losses. Our results highlight the importance of considering behavioral biases in inventory decision-making.

- 060-1097** The Impact of Inventory Risk on Market Prices
 Anton Ovchinnikov, Associate Professor, Queens University, Canada
 Gal Raz, Associate Professor, University of Virginia, United States

We demonstrate a surprising effect: that an increase in the number of competing firms may lead to an increase in the equilibrium market price in a situation when firms compete on both price and quantity (inventory/capacity). We attribute this effect to inventory risk and describe how it impacts market prices.

- 060-1397** Reaching 50 Million Nanostores
 Edgar Blanco, Professor, Massachusetts Institute of Technology, United States
 J. Fransoo, Professor, Technische Universiteit Eindhoven, Netherlands

This session will review the unique characteristics of nanostores, small owner-operated retailers in emerging markets, and their impact in designing urban supply chains. A series of case studies from around the world will be presented.

- 060-1403** How Do Retail Buyers Respond to Changes in Inventory Service Level?
 Nathan Craig, Assistant Professor, Ohio State University, United States
 Nicole DeHoratius, Professor, University of Chicago, United States
 Ananth Raman, Professor, Harvard University, United States

Using an apparel supplier's data, we study how the supplier's historical inventory service level affects its current demand from retailers. Increases in service are associated with statistically and managerially significant increases in retailer orders. We identify features of a retail buyer's decision context that influence the magnitude of the relationship.

60	Friday, 01:30 PM - 03:00 PM, Columbia 2 <i>Session:</i> Management of Trade-in Programs <i>Chair(s):</i> Mohammad Ghuloum	<i>Track:</i> Closed Loop Supply Chains
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- 060-0233** Optimal Dynamic Pricing for Trade-in Programs
 Mohammad Ghuloum, Student, Indiana University, United States
 Goker Aydin, Associate Professor, Indiana University, United States
 Gilvan Souza, Associate Professor, Indiana University, United States

Trade-in managers continuously monitor their inventory of used products, and adjust the acquisition and selling prices accordingly. Considering such a firm, we study a novel dynamic pricing problem, where not only the demand but also the supply of the product are random and sensitive to acquisition and selling prices.

- 060-0064** Trade-in Rebates for Price Discrimination and Product Recovery
 Vishal Agrawal, Assistant Professor, Georgetown University, United States
 Mark Ferguson, Professor, University of South Carolina, United States
 Gilvan Souza, Associate Professor, Indiana University, United States

Many OEMs offer trade-in rebates to existing customers when they purchase newer versions of a product. In business-to-business settings, the amounts of the rebates are often opaque to the firm's other customers, resulting in customized rebate amounts. We investigate the profitability of trade-in programs in the presence of remanufactured products.

- 060-0809** Lemons, Trade-ins, and Remanufacturing
 Ximin (Natalie) Huang, Student, Georgia Institute of Technology, United States
 Atalay Atas, 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. In this paper, we show when and how remanufacturing traded-in products can further improve the efficiency in secondary markets.

- 060-0388** Consumer Trade-in Program Design and the Quality of Returns
 Fei Qin, Student, McGill University, Canada
 Michael Fry, Professor, University of Cincinnati, United States

Uday Rao, Associate Professor, University of Cincinnati, United States

We study the structure of supply chains facilitating used-product return from, and resale to, end consumers. Our work shows how the quality of returned products may affect trade-in program efficiency as well as individual agent's preference of supply chain structures.

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Friday, 01:30 PM - 03:00 PM, Columbia 3

Track: Empirical Research in Operations Management

Session: Retail Empirical Research

Chair(s): Saravanan Kesavan Hyun Seok Lee

060-0184 Increasing Sales by Managing Congestion in Self-service Environments: Evidence from a Field Experiment

Saravanan Kesavan, Associate Professor, University of North Carolina Chapel Hill, United States

Vinayak Deshpande, Associate Professor, University of North Carolina Chapel Hill, United States

Hyun Seok Lee, Student, University of North Carolina Chapel Hill, United States

We examine impact of congestion in fitting-room on store performance. We demonstrate an inverted-U relationship between fitting-room traffic and sales. We find that co-production is more effective: increasing fitting-room labor by one person through field experiment increases sales per hour by 15.77%. Our solution was adopted with around 100 stores.

060-0319 Dynamic Pricing in Online Retailing: Evidence from Field Experiments and an Implementation

Marshall Fisher, Professor, University of Pennsylvania, United States

Santiago Gallino, Assistant Professor, Dartmouth College, United States

Jun Li, Assistant Professor, University of Michigan Ann Arbor, United States

A retailer following a competition-based dynamic pricing strategy tracks competitors' price changes and then must answer the following questions: (1) Should the retailer respond? (2) If so, respond to whom? (3) How much of a response? (4) And on which products? We answer these questions in this research.

060-1720 Coming Up To Speed: Tradeoffs Between Contextual Specialization and Contextual Diversity in Operating Performance

Hise Gibson, Student, Harvard University, United States

Ryan Buell, Professor, Harvard University, United States

Prithwiraj Choudhury, Professor, Harvard University, United States

Leveraging a natural experiment within the United States Army Corps of Engineers, we study how contextual specialization and contextual diversity affects an individual's capacity to contribute to organizational performance. We identify a tradeoff wherein contextually specialized individuals begin contributing sooner, but contextually diversified individuals ultimately achieve higher levels of performance.

060-1036 Determinants of Excess Inventory Announcements and Market Reaction

Hyun Seok Lee, Student, University of North Carolina Chapel Hill, United States

Saravanan Kesavan, Associate Professor, University of North Carolina Chapel Hill, United States

We first analyze what determines excess inventory announcements in the retail sector. Then we turn to the next question whether market reacts differently to firm's productivity (overall productivity and inventory productivity). Moreover, we also investigate the different impact of giving a reason of excess inventory in the announcement.

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Friday, 01:30 PM - 03:00 PM, Columbia 10

Track: Sustainable Operations

Session: Carbon Emission and Environmental Regulations

Chair(s): Charles Corbett

060-0650 The State of Scope 3 Carbon Emissions Reporting

Christian Blanco, Student, UCLA, United States

Felipe Caro, Associate Professor, University of California Los Angeles, United States

Charles Corbett, Professor, UCLA, United States

We compare upstream supply chain carbon emissions (scope 3) disclosed to CDP to estimates from Economic Input-output Life Cycle Assessment models. Firms are not required to disclose all their Scope 3 emissions; we provide an estimate of Scope 3 emissions the average firm reports.

060-0670 The Effect of Environmental Regulation on DfE Innovation: Assessing Social Cost in Primary and Secondary Market

Gal Raz, Associate Professor, University of Virginia, United States

Cheryl Druehl, 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.

060-0861 Challenges of Sustainability: Insights from the Global Food Sector

Aleda Roth, Professor, Clemson University, United States

We discuss the interrelationships between environmental harm and food supply chains. Our research demonstrates that the massive manufacturing investments in countries, where environmental regulations and/or enforcement are lax, may be putting the global food supply systems at risk. We conclude with a research agenda and recommendations for supply chain strategies.

- 060-0416** Modeling a Green Inventory Routing Problem for Perishable Products with Horizontal Collaboration
Mehmet Soysal, Student, Wageningen University, Netherlands
Jacqueline Bloemhof, Professor, Wageningen University, Netherlands
Rene Haijema, Assistant Professor, Wageningen University, Netherlands
Jack van der Vorst, Professor, Wageningen University, Netherlands

Supply chain logistics aims for cost effectiveness, high service and sustainability. A chance-constrained model for multi-supplier Inventory Routing Problem is presented accounting for perishability, explicit fuel consumption and demand uncertainty. Using case study within INTERREG IVB North-West Europe SCALE project benefits of horizontal collaboration on cost and emissions are analysed.

65	Friday, 01:30 PM - 03:00 PM, Columbia 11	<i>Track:</i> Manufacturing Operations
	<i>Session:</i> Maintenance Operations	
	<i>Chair(s):</i> Hakan Tarakci	

- 060-1310** Variables in the Maintenance of Electric Motors, by Powerline Communication and Multi-criteria Analysis
Murilo Leme, Assistant Professor, Federal University of Technology - Paraná, Brazil
Flavio Trojan, Professor, Federal University of Technology - Paraná, Brazil
Antonio Xavier, Associate Professor, Federal University of Technology - Paraná, Brazil

This paper explores the measuring of variables such as electric current, voltage, temperature, and vibrations in the maintenance of electric motors, by powerline communication, at industrial production in order to identify the better moment to realize the maintenance by multi-criteria analysis. An application and its results are also presented.

- 060-0697** A Measurement Model for Total Productive Maintenance
Nick Rich, Professor, Swansea University - School of Management, United Kingdom
Thomas Bortolotti, Lecturer, Swansea University - School of Management, United Kingdom

It is widely recognized the effectiveness of Total Productive Maintenance (TPM) in achieving productive excellence. However, the academic literature on TPM fails to show a clear picture of what TPM really is and how to measure it. This work contributes to the literature by proposing multidimensional and comprehensive TPM scales.

- 060-0716** Innovative Individualized Education on Time-based Maintenance Planning
Bram De Jonge, Student, University of Groningen, Netherlands

An innovative automated approach to generate individualized case studies on time-based maintenance planning is presented. It learns students to determine optimum maintenance strategies using familiar spreadsheet software based on historical lifetime data. The approach is currently implemented within various study programs and is suitable to be used by other institutions.

- 060-0027** Two Types of Learning Effects on Maintenance Activities
Hakan Tarakci, Assistant Professor, University of North Texas, United States

Two types of maintenance activities are considered for a system prone to failure: Preventive Maintenance (PM) and Minimal Repair. The repetitive nature of PM enables learning so that successive PMs are shorter and cheaper. The system also learns from failures/breakdowns during each PM cycle so that failure rates are reduced.

67	Friday, 01:30 PM - 03:00 PM, Piscataway	<i>Track:</i> Inventory Management
	<i>Session:</i> New Advances in Stochastic Inventory Control Problems: Structures and Asymptotics	
	<i>Chair(s):</i> Cong Shi	

- 060-0079** Optimality Gap of Constant-order Policies Decays Exponentially in the Lead Time for Lost Sales Models
Linwei Xin, Student, Georgia Institute of Technology, United States
David Goldberg, Assistant Professor, Georgia Institute of Technology, United States

Recently, Goldberg et al. (2012) laid the foundations for a new approach to solving lost-sales inventory models with leadtimes, by proving as the leadtime grows, a simple constant-order policy is asymptotically optimal. However, the bounds proven are impractical. In this work, we prove the optimality gap of constant-order policies actually converges exponentially fast to zero.

- 060-0088** Data-driven Algorithms for Nonparametric Multi-product Inventory Systems
Cong Shi, Assistant Professor, University of Michigan Ann Arbor, United States
Izak Duenyas, Professor, University of Michigan Ann Arbor, United States
Weidong Chen, Student, University of Michigan Ann Arbor, United States

We propose a data-driven algorithm for the management of stochastic multi-product inventory systems with limited storage as well as production cost uncertainty. The demand distribution is not known a priori and the manager only has access to past sales data (censored). We establish the convergence rate of our proposed algorithm.

- 060-0145** Multi-echelon Inventory Management with Short-term Commitments
Joel Goh, Assistant Professor, Harvard Business School, United States
Evan Porteus, Emeritus Professor, Stanford University, United States

We extend the classic Clark-Scarf serial multi-echelon inventory model to include short-term commitments, including non-binding commitments and two types of binding commitments. We prove a generalization of the Karush's lemma (1959) for our analysis and use it to show the existence of optimal inventory and commitment policies with base-stock-like structures.

- 060-1034** Optimality of (s,S) Policies in EOQ Models with General Cost Structures
Sandun Perera, Student, University of Texas Dallas, United States
Ganesh Janakiraman, Professor, University of Texas Dallas, United States
Shun-Chen Niu, Professor, University of Texas Dallas, United States

The EOQ model is at the heart of supply chain optimization. We show that an (s,S) policy is optimal under minimal assumptions on the ordering/procurement and holding/backorder cost. Our work lends theoretical credibility to the practice of using (s,S) policies for virtually any cost structure of practical interest.

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Friday, 01:30 PM - 03:00 PM, Cardozo

Track: Information in Operations Management

Session: Platform Strategies in Information Systems

Chair(s): Rajiv Mukherjee

- 060-0751** Hotspot Economics: Procurement of Third-party WiFi Capacity for Mobile Data Offloading
Liangfei Qiu, Assistant Professor, University of Florida, United States
Huaxia Rui, Assistant Professor, University of Rochester, United States
Andrew Whinston, Professor, University of Texas Austin, United States

The unprecedented growth of cellular traffic driven is creating challenges for cellular service providers to fulfill the unmet demand. In the present study, we propose an optimal procurement mechanism for service providers to leverage the advantages of both cellular and WiFi resources.

- 060-1402** Better Intermediation in Two-sided Markets
Mustafa Akan, Associate Professor, Carnegie Mellon University, United States

This paper proposes a mechanism to maximize the total number of successful matchings by improving the recommendation scheme the intermediaries follow. These recommendations play a crucial role because they shape the beliefs of the agents on the receiving end of the market about the other side.

- 060-0452** Dynamic Pricing of Enterprise Software with Value Uncertainty: Implication for Selling Software as a Service
Mingdi Xin, Assistant Professor, University of California Irvine, United States

This paper studies a software vendor's decision to offer perpetual or lease-based licensing when customers are uncertain about their valuation for the software prior to adoption, and shows that, in contrast to the prediction of traditional durable-goods theories, perpetual licensing can be more profitable than lease-based licensing.

69

Friday, 01:30 PM - 03:00 PM, Du Pont

Track: Humanitarian and Not-for-profit Operations

Session: Humanitarian Logistics

Chair(s): Melih Celik

- 060-0908** Optimal Access Restoration for Disaster Response
Felipe Aros-Vera, Reader, Rensselaer Polytechnic Institute, United States
Jose Holguin-Veras, Professor, Rensselaer Polytechnic Institute, United States
John Mitchell, Professor, Rensselaer Polytechnic Institute, United States

This research proposes an optimization model to solve the problem of access restoration during disaster response operations. The model takes into account capacity and scheduling constraints, and explicitly considers the impact on the affected population by using deprivation cost functions

- 060-0995** System Dynamics in Humanitarian Supply Chain Management
Rong Zhou, Reader, National University of Singapore, Singapore
Robert de Souza, Professor, National University of Singapore, Singapore

To deliver life-relief aids to victims in an effective and efficient way is always a challenge. It is necessary to develop a decision support tool for humanitarian supply chain management. We use System Dynamics to model humanitarian supply chains and a case study is provided to generate potential scenarios.

- 060-1320** Evidence-based Policy Design for HIV/AIDS Response Programs in Côte d'Ivoire
Paulo Goncalves, Associate Professor, University of Lugano, Switzerland
Simplice Kamdem, Senior Supply Chain Advisor, USAID/PEPFAR, Ivory Coast
Sebastian Villa Betancur, Student, University of Lugano, Switzerland

With 4% of its population infected, Cote d'Ivoire has the highest prevalence of HIV/AIDS in West Africa. We develop a formal dynamic model tracking over 20 years of the evolution of HIV/AIDS in Cote d'Ivoire. By projecting two decades into the future, we develop evidence-based policies for the treatment of HIV/AIDS.

- 060-1452** Implementing Operational Standards in Decentralized Humanitarian Organizations through Process Mapping
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

We study the efforts of two humanitarian organizations, Oxfam GB and International Rescue Committee (IRC), to standardize operations for growth and efficiency. Our analysis engaged professionals in various field offices directly through process mapping techniques. We develop insights and share practical tools for decentralized organizations aiming to implement operational standards.

70	Friday, 01:30 PM - 03:00 PM, Embassy	Track: Production Planning and Scheduling
	Session: Stochastic Scheduling	
	Chair(s): Melda Ormeci Matoglu	

- 060-0511** Reducing Variability in a Complex Process Industry
Christina Phillips, Student, Bangor University UK, United Kingdom
Konstantinos Nikolopoulos, Professor, Bangor University, United Kingdom

We examine variability reduction in a highly regulated, multiple component, and parallel mixed production manufacturing process with high endogenous variability. New batches require extensive testing which increases the variability of lead times and material availability, necessitating large buffer stocks within shelf life constraints. Uncertainty and complexity create lateral information deficits.

- 060-0553** Stochastic Lot Sizing under Uncertain Demand
Bulent Erenay, Student, Ohio University, United States
Gokhan Egilmez, Assistant Professor, North Dakota State University, United States
Gursel Suer, Professor, Ohio University, United States

Stochastic capacitated lot sizing problem is considered in the presence of probabilistic processing times and demand. A two-step hierarchical methodology is developed. First, stochastic capacity requirements are determined with statistical analysis & Monte-Carlo simulation. Second, a proposed stochastic nonlinear mathematical model is developed to solve the problem.

- 060-0976** Demand Volatility and Skill-orientated Workforce Scheduling
Matthias Schinner, Student, Rwth Aachen University, Germany
Peter Letmathe, Professor, Rwth Aachen University, Germany

We analyze the effect of learning-oriented task assignments to employees and different training strategies on costs and skill levels of employees. Taking demand volatility into account, we present an MIP workforce scheduling model that considers learning and forgetting of employees. The model incorporates skill development, knowledge depreciation and training measures.

- 060-1088** Managing Production and Capacity with Drift Control
Melda Ormeci Matoglu, Assistant Professor, University of New Hampshire, United States

We model the problem of managing capacity and determining the optimal buffer size in a BTO environment as a Brownian drift control problem and seek a policy that minimizes the long-term average cost. The controller can, at some cost, shift the processing rate, accept and reject orders.

71	Friday, 01:30 PM - 03:00 PM, Fairchild East	Track: Healthcare Operations Management
	Session: Improving Patient Surveillance	
	Chair(s): Jonathan Helm	

- 060-0430** Dynamic Personalized Monitoring and Treatment Control of Chronic Diseases
Pooyan Kazemian, Student, University of Michigan Ann Arbor, United States
Jonathan Helm, Assistant Professor, Indiana University, United States
Mariel Lavieri, Assistant Professor, University of Michigan Ann Arbor, United States
Joshua Stein, Assistant Professor, University of Michigan Ann Arbor, United States
Mark van Oyen, Professor, University of Michigan Ann Arbor, United States

We develop an innovative modeling framework for chronic disease patients to help guide clinicians to quickly detect disease progression and adjust the treatment plan over time to limit disease progression. Glaucoma is discussed as a case study.

- 060-1143** Cost-effectiveness of Alternative Colonoscopy Surveillance Policies to Mitigate Risk of Metachronous Colorectal Cancer
F. Erenay, Assistant Professor, University of Waterloo, Canada
Oguzhan Alagoz, Associate Professor, University of Wisconsin Madison, United States

Metachronous colorectal cancer (MCRC) incidence amongst colorectal cancer survivors varies significantly. We compared the performances of all-clinically-relevant alternative colonoscopy surveillance policies via simulation modeling under various MCRC incidence scenarios. We show that the guidelines might be improved by slightly increasing the surveillance intensity at the expense of moderately increased cost.

- 060-1528** Priority Rule within Emergency Department Triage System
Eric Park, Lecturer, University of British Columbia, Canada
Yichuan Ding, Assistant Professor, University of British Columbia, Canada
Mahesh Nagarajan, Associate Professor, University of British Columbia, Canada

We study a dataset of 530,000 patient records from 6 emergency departments (EDs) in metro Vancouver area. We analyze how priority rules within the ED triage system is affected by system status variables.

- 060-1211** Optimal Timing for Antihypertensive Prescriptions

Manaf Zargoush, Student, McGill University, Canada
Vedat Verter, Professor, McGill University, Canada
Mehmet Gumus, Associate Professor, McGill University, Canada
Stella Daskalopoulou, Professor, McGill University, Canada

We formulate the “antihypertensive prescription problem” as a Markov Decision Process, and investigate the impact of “learning” (in the Bayesian sense) on the optimal policies which are of threshold nature. We particularly address the following fundamental question: “which” medication and “when” should be prescribed given patients' characteristics and measurement uncertainties.

72	Friday, 01:30 PM - 03:00 PM, Fairchild West	Track: Healthcare Operations Management
	Session: Empirical healthcare	
	Chair(s): Bob Batt	

- 060-0262** Patients' Perception of Hospital Quality and Its Impact on Hospital Choice
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 a patient-level dataset across 35 New York hospitals, we document wide quality gap among hospitals. We then use a discrete choice model to estimate what influences patient perception of hospital quality and quantify the level of sub-optimality of their choices of hospitals.

- 060-0541** When Waiting to See a Doctor is Less Irritating: Understanding Patient Preferences in Appointment Scheduling
Nan Liu, Assistant Professor, Columbia University, United States
Stacey Finkelstein, Assistant Professor, City University of New York, United States
Margaret Kruk, Associate Professor, Columbia University, United States
David Rosenthal, Associate Professor, Columbia University, United States

Based on discrete choice experiments on two distinct populations, we establish that patients have strong preferences and make tradeoffs in a range of “operational” attributes when choosing among medical appointments. We identify significant heterogeneity in patient preferences, and in particular, an interesting gender effect on patient waiting cost functions.

- 060-1275** The Disposition Decision: Handoffs and End-of-Shift Effects in an Emergency Department
Bob Batt, Assistant Professor, University of Wisconsin Madison, United States
Diwas Kc, Associate Professor, Emory University, United States
Brad Staats, Professor, University of North Carolina Chapel Hill, United States
Brian Patterson, Assistant Professor, School of Medicine and Public Health, United States

We look at the effect of emergency department patients hand-offs on operational variables such as length of stay, revisit rate, physician productivity. We also examine what factors impact the probability of a patient being handed-off at the end of a shift versus being dispositioned by the current doctor.

- 060-1339** Testing Patient Patience: Role of Time to Appointment in Patient Flow
Nikolay Osadchiy, Assistant Professor, Emory University, United States
Diwas Kc, Associate Professor, Emory University, United States

Using data from over 900 providers, we examine the extent to which time to appointment impacts patient flow and overall clinic throughput.

73	Friday, 01:30 PM - 03:00 PM, Gunston East	Track: Global Operational Issues
	Session: Strategy and Behavior in Supply Chain Management	
	Chair(s): Xiaolin Xu	

- 060-0210** Quantity Commitment Strategy with Strategic Consumers
Xin Liu, Student, University of Science and Technology of China, China
Erfeng Zhou, Student, University of Science and Technology of China, China
Liang Liang, Professor, University of Science and Technology of China, China

We develop a two period pricing model for a seller utilizing quantity commitment strategy for sales period. We derive the seller's decisions when consumers are strategic, and discuss the impacts of information asymmetry on the consumer's choices and the seller's pricing strategies.

- 060-0682** How Gender and Social Comparison Affect Newsvendor Ordering Behavior
Juan Li, Associate Professor, Nanjing University, China
Fei Wei, Student, Nanjing University, China
Yulan Wang, Assistant Professor, Hong Kong Polytechnic Univ, Hong Kong

The paper sets up a social context in which newsvendors evaluate their performance relative to their peers by grouping two newsvendors and recruits female and male subjects to attend newsvendor experiments. The paper points out gender differences in ordering behavior is driven by gender differences in risk appetite.

- 060-0679** The Price of Social Comparison in a Competition Market
Juan Li, Associate Professor, Nanjing University, China

Di Zhang, Student, City University of Hong Kong, China
Xiaole Wu, Assistant Professor, Fudan University, China
Xiangdong Qin, Professor, Shanghai Jiao Tong University, China

The paper sets up one setting with one supplier and two retailers and obtain, (1) subjects will deviate from the optimal pricing decisions; (2) Gender differences in pricing is partially driven by (or mediated by) gender differences in competition appetite.

060-0596 Spot Trading vs. Wholesale Contract: The Role of Information Acquisition

Xiaolin Xu, Associate Professor, Nanjing University, China

In this paper, we consider a supply chain network consisting of one supplier and multiple retailers to study: first, whether the whole supply chain will under-invest in information acquisition under spot trading; second, what the value of spot market is, as compared to the traditional wholesale price contract.

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Friday, 01:30 PM - 03:00 PM, Gunston West

Track: Marketing and OM Interface

Session: Operational Decisions in Emerging Business Model

Chair(s): Raj Rajagopalan Guangwen Kong

060-0789 Optimal Timing of Sequential Distribution: The Impact of Congestion Externalities and Day-and-Date Strategies

Terrence August, Assistant Professor, University of California San Diego, United States

Duy Dao, Student, University of California San Diego, United States

Hyoduk Shin, Assistant Professor, University of California San Diego, United States

The window between a film's theatrical and video releases has been steadily declining with some studios now testing day-and-date strategies (i.e., when a film is released across multiple channels at once). Using a consumer choice between theatrical and video formats, we examine when is the optimal video release time.

060-0819 Overconfident Competing Newsvendors

Meng Li, Student, University of Illinois Urbana-Champaign, United States

Nicholas Petrucci, Professor, University of Illinois Urbana-Champaign, United States

Jun Zhang, Professor, Fudan University, China

Overconfidence is one of the most consistent, powerful, and widespread cognitive biases affecting decision making in situations characterized by random outcomes. In this paper, we study the effects and implications of overconfidence in a competitive newsvendor setting.

060-0823 Quality Consciousness, Perceived Value and Product Design

Karthik Ramachandran, Associate Professor, Georgia Institute of Technology, United States

Priyali Rajagopal, Associate Professor, University of South Carolina, United States

Sreekumar Bhaskaran, Associate Professor, Southern Methodist University, United States

Cannibalization usually tensions forces firms to trim their product line (at the low end) or offer degraded products at the low-end. In this paper, we revisit this result when quality conscious consumers perceive low-end (or, high-end) products to be even lower (or, higher) quality than less quality conscious consumers.

060-1428 Optimal Promotion Strategy for a Service Firm with Delay Sensitive Customers

Guangwen Kong, Assistant Professor, University of Minnesota, United States

Ramandeep Randhawa, Associate Professor, University of Southern California, United States

Online social advertising tools such as Groupon generate new business for service providers and at the same time generate new challenges. Discount-seeking customers may impose externalities on the system that could drive away regular customers. We analyze these trade-offs and devise recommendations as to when would Groupon promotions be beneficial.

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Friday, 01:30 PM - 03:00 PM, Coats

Track: Retail Operations Management

Session: Novel Ideas in Retail Operations

Chair(s): Aydin Alptekinoglu

060-0420 Estimating Willingness-to-Pay and Reserve Prices from Negotiation Data and the Implications for Pricing

A. Serdar Simsek, Lecturer, Cornell University, United States

Robert Phillips, Professor, Columbia University, United States

Garrett van Ryzin, Professor, Columbia University, United States

In many businesses, the final sales price is the result of a negotiation between buyer and seller. We discuss results on a novel method for estimating willingness-to-pay and reserve price distributions from negotiations data. Estimated distributions can be used to optimize controls on negotiated prices that can significantly increase revenues.

060-0816 Channel Integration, Sales Dispersion, and Inventory Management

Santiago Gallino, Assistant Professor, Dartmouth College, United States

Antonio Moreno-Garcia, Assistant Professor, Northwestern University, United States

Ioannis Stamatopoulos, Student, Northwestern University, United States

Channel integration initiatives are a rapidly increasing trend in retail, creating uncharted areas in marketing, logistics and inventory management. Using data from a leading retailer, we analyze the effects of implementing of a "ship-to-store" functionality, which improves access to SKUs not available in brick-and-mortar stores, to sales dispersion and inventories.

- 060-0963** Gleaning Inferences from Soldout Products
Xin Ge, Associate Professor, University of Northern British Columbia, Canada
Paul Messinger, Associate Professor, University of Alberta, Canada
Yuanfang Lin, Assistant Professor, Wilfrid Laurier University, Canada

We show that consumers draw positive inferences about the desirability of a product when similar products are observed to sell out. Such a “preference signaling” effect is predicted by a utility-theoretic Bayesian inference model. We test the model predictions in three behavioral experiments.

- 060-1380** Incorporating Buyer’s Paralysis into the MNL Choice Model
Rene Caldentey, Associate Professor, New York University, United States
Srikanth Jagabathula, Assistant Professor, Stern School of Business, United States
Anisha Patel, Consultant, IBM, United States

We empirically investigate the notion of choice paralysis (i.e., too many options can paralyze a consumer and make them more prone to not purchasing) and study its implications on assortment and inventory decisions. We propose a modification to the MNL model to incorporate the choice paralysis effect.

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| 76 | Friday, 01:30 PM - 03:00 PM, Monroe | Track: Meetings & Symposiums |
| | Session: Doctoral Consortium 1 | |
| | Chair(s): Rachna Shah | |

- 060-1700** Doctoral Consortium 1
Rachna Shah, Associate Professor, University of Minnesota, 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.

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| 77 | Friday, 01:30 PM - 03:00 PM, Holmead East | Track: Product Innovation and Technology Management |
| | Session: Collaborative Innovation | |
| | Chair(s): Fabian Sting | |

- 060-0318** Direct or Indirect Outsourcing? The Effect of Outsourcing Knowledge on the Dynamics of Outsourcing Modes
Qiong Chen, Student, Clemson University, United States
Gulru Ozkan-Seely, Assistant Professor, Georgia Institute of Technology, United States
Shouqiang Wang, Assistant Professor, Clemson University, United States
Aleda Roth, Professor, Clemson University, United States

We evaluate buyer's dynamic choice of outsourcing channels: directly through in-house procurement department or indirectly through an intermediary. Using a two-period game theoretic model, we demonstrate the critical yet interesting role of outsourcing knowledge and highlight effects of direct and indirect learning on the change of buyer's strategies over time.

- 060-0337** Dynamics of Delegated Search
Morvarid Rahmani, Assistant Professor, Georgia Institute of Technology, United States
Karthik Ramachandran, Associate Professor, Georgia Institute of Technology, United States

In this study, we consider a client that has delegated the design of a new product to a vendor. We examine the effect of payment structure, the client's clarity in defining his desired design specifications, and the vendor's strategic behavior in effort exertion on the dynamics of delegated search.

- 060-0308** How (and When) to Encourage Cooperation across Projects
Fabian Sting, Assistant Professor, Rotterdam School of Management, Netherlands
Pascale Crama, Assistant Professor, Singapore Management University, Singapore
Yaoyong Wu, Associate Professor, National University of Singapore, Singapore

Inspired by an innovative practice, we model a PM system that incorporates and shapes cooperative behavior. Help is at the core of this system, in which project managers may ask for and provide help. We find that companies should take a nuanced approach when designing help exchange and time-based incentives.

- 060-0966** Collaboration in Global Product Development
Sara Rezaee Vessal, Student, Hec Paris, France
Svenja Sommer, Associate Professor, Hec Paris, France

To successfully compete on an international scale, multinational companies turn towards globally dispersed product development teams, both to draw on a diverse set of expertise and to access more accurate local market knowledge. In this study, we compare dispersed and co-located teams and address the question how to incentivize them.

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| 78 | Friday, 01:30 PM - 03:00 PM, Holmead West | Track: Product Innovation and Technology Management |
| | Session: An Examination of Program, Portfolio and Organizational Decisions on Product Development Success | |
| | Chair(s): Thomas Friedli | |

- 060-0293** Product-platform-Attribute Decisions Based on Total Supply Chain Costs
Maud van den Broeke, Student, Vlerick Management School, Belgium
Robert Boute, Associate Professor, Vlerick Management School, Belgium

Brecht Cardoen, Assistant Professor, Katholieke Universiteit Leuven, Belgium

Behzad Samii, Assistant Professor, Vlerick Management School, Belgium

We develop a model to quantify the impact of product-platform decisions on total supply chain costs, and to determine which attributes the platforms should have given the products derived from them (over vs. under-design). A fathoming rule is proposed to enable fast computation of large real-business problems.

060-0383 Estimation of Downside Risks in Project Portfolio Selection

Janne Kettunen, Assistant Professor, George Washington University, United States

Ahti Salo, Professor, Aalto University, Finland

We show that uncertainties in project portfolio selection have major implications for the development of risk estimates about portfolio value. To improve the accuracy of risk estimates, we propose the use of calibration curves which can be derived by analyzing past selection processes or by simulating the portfolio selection process.

060-1159 From Functional to Cross-functional Management of Product Portfolio Complexity

Lukas Budde, Student, Institute of Technology Management - Chair of Production Management, Switzerland

Thomas Friedli, Associate Professor, University of St. Gallen, Switzerland

Axel Faix, Student, University of St. Gallen, Switzerland

This paper explains a novel cross-functional evaluation concept for product portfolio complexity management. In a holistic approach it combines and connects four main evaluation dimensions which are integrated into a complexity index model. The validation of the concept will be explained along an industry project within a manufacturing company.

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Friday, 01:30 PM - 03:00 PM, Kalorama

Track: Supply Chain Management

Session: Disruption Risk in Supply Chains

Chair(s): Robert Swinney

060-0104 Disruption Risk and Optimal Sourcing in Multi-tier Supply Networks

Erjie Ang, Student, Stanford University, United States

Dan Iancu, Assistant Professor, Graduate School of Business, United States

Robert Swinney, Associate Professor, Duke University Durham, United States

We study optimal sourcing in a decentralized supply network, in which a manufacturer can only influence sourcing from higher tiers via contractual offerings to immediate suppliers. We show how the supply chain configuration critically influences sourcing strategies, giving rise to a severe moral hazard problem in the supplier choice.

060-0341 On Public Warnings in Counterterrorism Operations

Nitin Bakshi, Assistant Professor, London Business School, United Kingdom

Edieal Pinker, Professor, Yale University, United States

Public warnings, or terror alerts, might be a victim of their own success. Previous alerts that negated an attack result in the perception of a false alarm. We study the trade-off between the short-term benefit of a deferred attack, and long-term costs such as erosion of credibility through false alarms.

060-0401 Timing and Signaling Considerations for Recovery from Supply Chain Disruption

Zhibin (Ben) Yang, Assistant Professor, University of Oregon, United States

Nagesh Murthy, Associate Professor, University of Oregon, United States

We model a supplier's and buyer's choice between backup option and supply recovery in response to supply disruption as a signaling game, where the supplier has better information about disruption severity and quotes recovery due date. We find that costly signaling occurs when the buyer's has low backup cost.

060-1095 Competition in Supply Chain Networks in the Presence of Disruption Risk

Kostas Bimpikis, Assistant Professor, Stanford University, United States

Ozan Candogan, Assistant Professor, Fuqua school of business, United States

Shayan Ehsani, Student, Stanford University, United States

We study multi-tier supply chains in the presence of disruption risk. A network structure determines the set of potential supply relationships and the extent of competition among firms. We characterize the equilibrium of the strategic interaction between firms, and provide a ranking of networks that maximize industry/consumer surplus and efficiency.

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Friday, 01:30 PM - 03:00 PM, Jay

Track: Supply Chain Management

Session: Supply Chains in Global Markets

Chair(s): Muhammad Abdulrahman

060-0693 Exploration Capabilities of a Supply Chain: A Study of Export Oriented SMEs in India

MohdNishat Faisal, Associate Professor, CBE, Qatar University, Qatar

SMEs in India are facing tough competition from companies in China, Malaysia, and Thailand. To survive in World markets, these SMEs need to develop exploration capabilities. The present paper presents the findings of the study that focused on understanding the exploration capabilities of SMEs supply chains in India.

060-1017 Collaboration or Conflict? Information Sharing in Supply Chains of the German Automotive Industry

Liyuan Wang, Student, Ebs Business School, Germany
Ulrich Berbner, Student, Technical University Darmstadt, Afghanistan
Hans-Christian Pfohl, Professor, Technical University Darmstadt, Germany

We study how and why information sharing interacts with conflicts of interest and different objectives among supply chain partners as well as impacts of information sharing on supply chain performance in the German automotive industry. Agency theory serves as our theoretical lens. Data was collected through interviews and focus group.

060-1384 Reactive Capacity Strategy of the Mexican Electronic Industry: An Empirical Study
Miguel Estrada, Professor, Ipade Business School, Mexico

Mexico's electronics industry has been based on reactive supply chain strategies for the North American market. This empirical research measures the relationship among different practices, such as reactive manufacturing, knowledge sharing, technological level, or supply chain position, and the relative impact of such practices on the chain's reactive capacity.

060-0977 Corruption and Firm Behaviour: Evidence from China Based Shipping Firms
Muhammad Abdulrahman, Assistant Professor, Nottingham University Business School Ningbo, China, China
Nachiappan Subramanian, Associate Professor, Nottingham University Business School Ningbo, China, China
Jing Yu Yang, Senior Lecturer, The University of Sydney Business School, Australia

Based on data collected from 132 China based shipping firms, we empirically investigate the impact of corruption on the final price of shipping clearance services at ports in Nigeria. The study highlights the role of firms' anti-corruption practices and their inclination towards corruption on final cost of clearance services.

81	Friday, 01:30 PM - 03:00 PM, Morgan	Track: Operations Management Practice
	Session: Modeling in Practice	
	Chair(s): Pengyuan Wang	

060-1139 An Economic Analysis of the Air Cargo Problems in an Integrated Supply Chain
Kwon Gi Mun, Student, Rutgers University, United States
Yao Zhao, Associate Professor, Rutgers University, United States
Endre Boros, Professor, Rutgers University, United States
Arim Park, Student, Rutgers University, United States

In this model, we demonstrate an integrated forecasting approach to coordinate ground and air transportation for a Korean air cargo company. Therefore, we present expected benefits of this integrated approach compared to current practice.

060-1606 Selling Work-in-Progress EBooks: Involving Readers in the Writing Process
Zhendong Pan, Associate Professor, Dongbei University of Finance and Economics, China
Kathryn Stecke, Professor, University of Texas Dallas, United States
Jiafu Tang, Professor, Dongbei University of Finance and Economics, China

This paper studies optimal contract structure for an innovative online EBook seller - writers submit finished chapter on an ongoing basis, while interested readers pay a small fee to read online. This EBook platform has shown to be operational convenient and financially benefiting all parties: EBook sellers, writers and readers.

060-1567 Robust Tree-based Causal Inference for Complex Ad Effectiveness Analysis
Pengyuan Wang, Yahoo Labs, Yahoo Labs, United States

The diversity and generality of online ad treatments call for accurate causal measurement of ad effectiveness. In this paper we propose a novel causal inference framework. We apply it to two advertising campaigns, and shows that the ad frequency has a treatment effect cap, and naive estimation leads to overestimation.

82	Friday, 01:30 PM - 03:00 PM, Northwest	Track: Revenue Management and Pricing
	Session: Pricing and Demand Models	
	Chair(s): Ruxian Wang Zizhuo Wang	

060-0732 On Upper Bounds for Assortment Optimization under the Mixture of Multinomial Logit Models
Sumit Kunnumkal, Assistant Professor, Indian School of Business, India

We analytically compare the upper bounds obtained by the different approximation methods for assortment optimization under the mixture of multinomial logits. We propose a new, tractable approach to construct an upper bound on the optimal expected revenue.

060-1387 Demand Forecasting When Customers Consider, Then Choose
Srikanth Jagabathula, Assistant Professor, New York University, United States
Ying Liu, Student, New York University, United States

We consider the problem of demand forecasting when customers choose by first forming a consideration set and then choosing the most preferred product from the consideration set. The consideration set is sampled from a general model over subsets. We propose techniques to estimate such models from purchase transaction data.

060-1224 Product Design and Pricing under Logit Model

Guillermo Gallego, Professor, Columbia University, United States

Anran Li, Student, Columbia University, United States

We study a firm who wants to design and price a set of products characterized by a number of features where each feature has one or multiple levels. We model consumers' demand by a feature-level based multinomial Logit or Nested Logit model and optimize the assortment on the features space.

060-0181 Consumer Choice Models with Endogenous Network Effects

Ruxian Wang, Student, Johns Hopkins University, United States

Zizhuo Wang, Assistant Professor, University of Minnesota, United States

Network externality arises when product utility not only depends on attribute valuations, but also on the number of users. We propose and analyze a choice model taking into account the network effects. We show the optimality of a new class of assortments, called a quasi-revenue-ordered assortment.

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Friday, 01:30 PM - 03:00 PM, Oak Lawn

Session: Supply Chain Risk Management

Chair(s): Wei Luo

Track: Risk Management in Operations

060-0576 Financial Pooling in Supply Chains

Ming Hu, Assistant Professor, University of Toronto, Canada

Qu Qian, Lecturer, SIM University, Singapore

S. Alex Yang, Assistant Professor, London Business School, United Kingdom

Trade credit pools liquidity between suppliers and retailers. Due to this pooling effect, even as the supplier's cost of capital is higher, the retailer may still demand for trade credit. Supply chain finance increases the efficiency of this pooling effect, and as a result reduces the overall chain financing cost.

060-1323 Reverse Factoring and Supply Risk

K. van der Vliet, Student, Eindhoven University of Technology, Netherlands

M. Reindorp, Assistant Professor, Eindhoven University of Technology, Netherlands

J. Fransoo, Professor, Technische Universiteit Eindhoven, Netherlands

A supplier serves two retailers. Retailer X facilitates early payment through reverse factoring; retailer Y pays with a fixed delay. Will the supplier naturally provide a higher service level to X? What service level improvement could X require? What is the impact of demand size, uncertainty, and correlation?

060-1727 The Strategic Role of Business Insurance In Managing Supply Chain Risk

Juan Serpa, Student, University of British Columbia, Canada

Harish Krishnan, Associate Professor, University of British Columbia, Canada

We show that firms in a supply chain may strategically buy insurance purely as a commitment mechanism to prevent excessive free-riding by other firms. Insured firms can credibly commit to lower effort, thereby mitigating the incentives of wealth-constrained firms to free-ride on their efforts.

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Friday, 01:30 PM - 03:00 PM, Parlor A

Session: Lean and Quality Operations

Chair(s): Rosanna Fornasiero

Track: General Track

060-1173 The Impact of Outsourcing and Offshoring on Product Recalling in the Pharmaceutical Industry

Manfredi Bruccoleri, Associate Professor, University of Palermo, Italy

Erica Mazzola, Assistant Professor, Università Degli Studi Di Palermo, Italy

Enzo Graceffa, Student, Università Degli Studi Di Palermo, Italy

Supply chain globalization has caused the increase in product recalls in the last years. However we argue that outsourcing and offshoring also influence the way in which companies deal with the occurred recall. In this paper we explore supply chain responsiveness in managing recalls by analyzing data from secondary sources.

060-0669 Study of the Application of Lean Manufacturing Techniques on the Baking Industry in Medellin

Juan Arrieta - Posada, Professor, Universidad Eafit, Colombia

Maria del Rocio Quesada-Castro, Student, Universidad EAFIT, Colombia

The bakery industry in Medellin has an important economic and social significance, most of the companies are small, with high levels of informality, low added value and low productivity, this work is looking for evaluate the level of implementation of Lean Manufacturing techniques in this kind of industries.

060-0583 Going Beyond Lean-agile Models for Supply Chain of Personalized Products

Laura Macchion, Student, Università Degli Studi Di Padova, Italy

Rosanna Fornasiero, Lecturer, CNR-ITIA, Italy

Andrea Vinelli, Professor, Università Di Padova, Italy

Pamela Danese, Associate Professor, Università Degli Studi Di Padova, Italy

The research aims to revise the supply chain model to go beyond the duality of lean/agile approach and answer to new personalization requirements in the fashion sector. This is based on 4 in-depth case studies within the footwear industry.

060-0202 Improved Method of Estimating the Product Quality After Repetitive Inspections

Young Chun, Professor, Louisiana State University, United States

Based on the number of defects discovered during each round of inspections, one can estimate the number of defects still remaining in the product. We propose an inspection model that describes the heterogeneity in detection probability as a beta distribution. Our model outperforms other methods with a constant detection probability.

86	Friday, 01:30 PM - 03:00 PM, Parlor B <i>Session:</i> Analytic Examinations of Supply Management Decisions <i>Chair(s):</i> Vivekanand Khanapuri	<i>Track:</i> Purchasing and Supply Management
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060-1580 A Model to Improve Sourcing Strategy for Beverage Supply Chain
Vivekanand Khanapuri, Professor, National Institute of Industrial Engineering, Mumbai, India
Kailash Mahadevan, Student, National Institute of Industrial Engineering, Mumbai, India

One key decision at warehouse in highly competitive beverage (non-alcoholic) industry, is sourcing finished goods from different plants/products. An optimal decision involves evaluating trade-offs related to different costs. A model to determine sourcing strategy considering the business constraints and reduce overall supply chain costs is proposed for this beverage supply chain.

060-0954 Capacity Allocation and Ordering Decisions in a Supply Chain under Supply Uncertainty and Information Symmetry
Cheng Zhou, Student, Southeast University, China
Haiyan Wang, Professor, Southeast University, China

This paper investigates the capacity allocation and ordering decisions in a supply chain under supply uncertainty, where manufacture's individual demand leads to supplier's additional processing which reduces the reliability of supply. We found that the demand individualization influences the transfer of process capacity and ordering decisions of the supply chain.

060-0010 Minimizing Costs in the Supply Chain Considering Quality and Delivery Time
Daniel Olivares Vera, Professor, Universidad De La Salle Bajio, Mexico
Eleazar Puente, Professor, ITESM (Campus Leon), Mexico
Elias Olivares Benítez, Professor, UPAEP, Mexico

A Mixed Integer Linear Programming model is proposed aimed to optimize allocation of orders along a four-echelon supply chain. The model takes into account quality and delivery time capabilities indices in the supply chain and their impact on total costs. The model has no industry specific features.

060-0182 Supplier Capacity Competition under Production Cost Uncertainties
Tarun Jain, Student, Indian Institute of Management Bangalore, India
Jishnu Hazra, Professor, Indian Institute of Management Bangalore, India

We model a supply chain with two suppliers and a single buyer. The suppliers facing production cost uncertainties simultaneously make capacity investment decisions. The buyer purchases capacity from these two competing suppliers. We characterize the Nash equilibrium strategies of this competition.

87	Friday, 01:30 PM - 03:00 PM, Columbia 5-8 <i>Session:</i> Semi-Plenary on Relevance, Service Operations College: The Grass on the Other Side - How is it being a Mathematician in Industry? <i>Chair(s):</i> Joy Field	<i>Track:</i> Meetings & Symposiums
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060-1698 The Grass on the Other Side - How Is It Being a Mathematician in Industry?
Vaidyanathan Ramaswami, Vice President, Strategy & Research, Color EyeQ, United States

Do the statisticians and mathematicians in industry really get a chance to think and innovate, or do they just have to turn the crank endlessly? Are they given things to do, and if not how do they find interesting things to do? What are the trade-offs between academia and industry?

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Friday, 03:15 PM - 04:45 PM, Columbia 1

Track: Behavior in Operations Management*Session:* Behavioral Research in Pricing and Procurement*Chair(s):* Elena Katok**060-0438** How Supplier Scorecards Affect Quality: A Behavioral Study

Elena Katok, Professor, University of Texas Dallas, United States

Zhixi Wan, Assistant Professor, University of Illinois Urbana-Champaign, United States

We present an analytical model and a laboratory experiment to study supplier behavior in response to scorecards. We find that players are likely to provide higher quality than the model predicts, although the model predicts the best scorecard design well.

060-0549 Is a Newsvendor More Bounded Rational Making Two Decisions Instead of One?

Shan Li, Assistant Professor, Baruch College, United States

Kay yut Chen, Professor, University of Texas Arlington, United States

The behavior newsvendor literature focuses on scenarios of a single (but repeated) decision. We conduct an experimental study with newsvendor making two unrelated (managing independent stores) and related (via transshipment) decisions simultaneously. We found non-trivial correlations between decisions across stores, and constructed a behavioral/learning model to explain the findings.

060-0558 Inequity and Loss Aversion in Pay What You Want

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

Yulia Vorotyntseva, Student, University of Texas Dallas, United States

We investigate how factors, such as production cost, affect the buyer's decision to abuse Pay-What-You-Want pricing. We use the distributional fairness approach to build a model of buyers' behavior and test it in a controlled laboratory experiment.

060-0930 Sharing in the Benefits of Learning-by-Doing: A Laboratory Investigation of Procurement Auction Mechanisms

Blair Flicker, Student, University of Texas Dallas, United States

Wedad Elmaghraby, Associate Professor, University of Maryland, United States

Elena Katok, Professor, University of Texas Dallas, United States

Buyers looking to share in suppliers' learning-by-doing savings can either (i) draft long-term contracts with payment reduction schedules or (ii) encourage competition via sequential short-term contracts. Theoretically, there is minimal cost difference between the two approaches, but behavioral findings suggest that humans do respond differentially to the two mechanisms.

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Friday, 03:15 PM - 04:45 PM, Columbia 2

Track: Supply Chain Management*Session:* College of SCM Student Paper Competition I*Chair(s):* Vinayak Deshpande**060-1725** Dynamic Pricing and Inventory Control with Nonparametric Demand Learning

Beryl Chen, Student, University of Michigan Ann Arbor, United States

Xiuli Chao, Professor, University of Michigan Ann Arbor, United States

Hyun-soo Ahn, Associate Professor, University of Michigan Ann Arbor, United States

A firm has to make pricing and ordering decisions based on historical demand data. We propose a nonparametric data-driven policy that learns about demand and applies learned information to determine replenishment/pricing decisions. The policy integrates learning and action. We prove that the regret vanishes as the planning horizon increases.

060-0054 The Strategic Role of Business Insurance In Managing Supply Chain Risk

Juan Serpa, Student, University of British Columbia, Canada

Harish Krishnan, Associate Professor, University of British Columbia, Canada

We show that firms in a supply chain may strategically buy insurance purely as a commitment mechanism to prevent excessive free-riding by other firms. Insured firms can credibly commit to lower effort, thereby mitigating the incentives of wealth-constrained firms to free-ride on their efforts.

060-1724 Combating Child Labor: Incentives and Information Transparency in Global Supply Chains

Ying Xu, Student, Carnegie Mellon University, United States

Soo-Haeng Cho, Associate Professor, Carnegie Mellon University, United States

Sridhar Tayur, Professor, Carnegie Mellon University, United States

Nearly 200 million children are engaged in child labor as part of the supply base of global manufacturing networks. We analyze the firm's strategies to mitigate its supplier's use of child labor. We find that supply chain transparency may backfire and inadvertently induce additional child labor.

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Friday, 03:15 PM - 04:45 PM, Columbia 3

Track: Empirical Research in Operations Management*Session:* Emerging business models*Chair(s):* Jun Li Antonio Moreno-Garcia**060-0876** Product Variety for Information Goods: Evidence from Indian Agriculture

Christopher Parker, Assistant Professor, Penn State University University Park, United States

Kamalini Ramdas, Professor, London Business School, United Kingdom

Nicos Savva, Assistant Professor, London Business School, United Kingdom

Farmers in India can receive daily price information via a text message subscription service in their choice of up to three of several markets. Using a large dataset on farmers' choices, we model the farmers' decision process to understand how characteristics of the markets/crops impact subscription preferences and firm profitability.

- 060-0878** Strategically Giving Service: Driver Behavior in an E-hailing Platform
Antonio Moreno-Garcia, Assistant Professor, Northwestern University, United States
Can Ozkan, Student, Kellogg School of Management, United States

The use of e-hailing taxi platforms provides taxi drivers with access to an unprecedented amount of information about their competitors. Using data from one of the leading e-hailing apps in South America, we study how taxi drivers respond to the availability of rich information about spatial competition.

- 060-1209** Business Models and System Performance: Empirical Evidence from the U.S. Solar Energy Market
Jose Guajardo, Assistant Professor, University of California Berkeley, United States

We empirically analyze the relationship between business models and system performance in the U.S. solar energy market, characterizing the drivers and mechanisms by which different business models affect system performance.

- 060-0550** Agent Behavior in the Sharing Economy: Evidence from AirBnB
Dennis Zhang, Student, Northwestern University, United States
Jun Li, Assistant Professor, University of Michigan Ann Arbor, United States
Antonio Moreno-Garcia, Assistant Professor, Northwestern University, United States

Using availability and pricing data from a rising peer-to-peer online hospitality service platform -- AirBnB, we study agent behavior and its implications in the sharing economy.

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| 91 | Friday, 03:15 PM - 04:45 PM, Columbia 4 | Track: Empirical Research in Operations Management |
| | Session: Global Empirical Research | |
| | Chair(s): Yan Dong | |

- 060-1501** Business Environmental Factors and Operations Strategies of Firms in Ghana
Kwasi Amoako-Gyampah, Professor, University of North Carolina Greensboro, United States
Samuel Famiyeh, Senior Lecturer, Ghana Institute of Management and Public, Ghana
Ebenezer Adaku, Lecturer, Ghana Institute of Management and Public Administration, Ghana

Despite years of IMF/World Bank reforms Ghanaian firms still struggle to compete in the face of an increasing influx of cheap (and sometimes higher quality) imports. This study examines the impact of business environmental factors on the operations strategy of firms in Ghana with the goal of enhancing their competitiveness

- 060-1581** Comparison of Perceived Quality in Manufacturing Plants across Countries
Tomoaki Shimada, Associate Professor, Kobe University, Japan
James Ang, Associate Professor, National University of Singapore, Singapore
Yoshiki Matsui, Professor, Yokohama National University, Japan

We study two important concepts in quality management: continuous improvement and customer satisfaction. The data were collected from 339 manufacturing plants located in the 11 countries by means of questionnaire survey. Based on the results from statistical analysis, we also discuss the limitations of questionnaire survey in empirical research.

- 060-1030** Distinctive Aspects of Work Organization in Social Enterprises: Participant Observation in Scavenger Cooperatives
Henrique Chagas, Student, Universidade De Sao Paulo, Brazil
João Amato-Neto, Professor, Universidade De Sao Paulo, Brazil

Social Enterprises are economic ventures that attempts to solve a social problem through an economic activity. They are guided by different values and principles and this reflects on the work configuration. From a participant observation (5 months) in scavengers' cooperatives, this article points out some distinctives aspects on work organization.

- 060-1461** Emissions and Firm Performance: An Empirical Study of Global Firms
Yan Dong, Assistant Professor, University of South Carolina, United States
Kefeng Xu, Associate Professor, University of Texas San Antonio, United States
Sining Song, Student, Arizona State University Phoenix, United States
Craig Carter, Associate Professor, Arizona State University Tempe, United States

Globalization creates new markets and improves cost efficiency, but it also stretches supply chains which may increase supply chain emissions. This study focuses on the effect of emissions on the financial performance of global firms, and empirically examines how firms may improve financial performance by implementing emissions control programs

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| 92 | Friday, 03:15 PM - 04:45 PM, Columbia 9 | Track: Scheduling and Logistics |
| | Session: Production Scheduling Problems | |
| | Chair(s): Anurag Agarwal | |

060-1674 A Discrete Cuckoo Search Algorithm for the Identical Parallel Machine Scheduling Problem

Jatinder Gupta, Professor, University of Alabama in Huntsville, United States

Dipak Laha, Professor, Jadavpur University, India

We present an improved cuckoo search algorithm to minimize makespan for identical parallel-machine scheduling problems. Empirical results with a large number of randomly generated well-known benchmark problem instances demonstrate that the proposed method produces solutions that are fairly superior to those of the state-of-the-art algorithms in the literature.

060-1212 Modeling Job Execution Characteristics on Cluster Using Markov Decision Process

Ajaya Swain, Assistant Professor, St. Mary'S University, United States

Task execution time estimation inaccuracy causes underutilization of cluster resources. By modeling the task execution time as a Markov Chain and estimating the worst case execution time of tasks, we try to minimize the total waiting time in queue. We evaluate our model using the real world data.

060-0255 A New Fuzzy Modeling Approach for Joint Manufacturing Scheduling and Shipping Decisions

Can Celikbilek, Student, Industrial & Systems Engineering, United States

Sadegh Mirshekarianbabaki, Student, Ohio University, United States

Gursel Suer, Professor, Industrial & Systems Engineering, United States

This study discusses a new fuzzy modeling approach for an integrated manufacturing scheduling and shipment decisions within a supply chain network. The aim of this study is to maximize the total net profit while minimizing the risks caused by selecting alternative transportation modes. Different transportation modes are considered.

060-0644 A Neurogenetic Approach for the Flow Shop Scheduling Problem

Anurag Agarwal, Professor, University of South Florida, United States

Ramakrishna Govindu, Lecturer, University of South Florida, United States

We solve the Flow Shop Problem using a Neurogenetic Approach. In the Neurogenetic approach, the Neural Network approach and the Genetic Algorithms Approach are interleaved to provide better solutions than any one approach by itself for the same computing resources.

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Friday, 03:15 PM - 04:45 PM, Columbia 10

Track: Sustainable Operations

Session: Socially Relevant Operations Management

Chair(s): Liying Mu

060-1423 Socially Optimal Contracting between a Regional Blood Bank and Hospitals

Tharanga Rajapakshe, Assistant Professor, University of Florida, United States

Anand Paul, Associate Professor, University of Florida, United States

Motivated by the operational challenges faced by a Regional Blood Bank in distributing the blood among the hospitals in its service area, our focus in this work is to provide easy-to-implement contracts to improve the operational performance of a blood bank.

060-0207 Milking the Quality Test: Improving the Milk Supply Chain under Competing Intermediaries

Liying Mu, Assistant Professor, University of Delaware, United States

Milind Dawande, Professor, University of Texas Dallas, United States

Xianjun Geng, Associate Professor, University of Texas Dallas, United States

Vijay Mookerjee, Professor, University of Texas Dallas, United States

We examine operational and incentive issues that conspire to reduce the quality of milk -- via deliberate adulteration by milk farmers -- acquired by competing collection intermediaries in developing countries. We then propose two interventions to reduce milk adulteration using minimal testing.

060-0256 Responsible Sourcing via Vertical Integration: The Impacts of Scrutiny, Demand Externality, and Cross Sourcing

Adem Orsdemir, Assistant Professor, University of California Riverside, United States

Bin Hu, Assistant Professor, University of North Carolina Chapel Hill, United States

Vinayak Deshpande, Associate Professor, University of North Carolina Chapel Hill, United States

Vertical integration is a viable way to achieve responsible sourcing. In a competitive setting, we analyze a firm's integration and responsible sourcing decisions. We find that demand externality and possibility of supplying the competitor may fundamentally change firms' behaviors. Furthermore, high probability of violation detection may discourage responsible sourcing.

060-0415 Impact of Electricity Pricing Policy on Renewable Energy Investments and Carbon Emissions

Gurhan Kok, Professor, Koc University, Turkey

Kevin Shang, Associate Professor, Duke University Durham, United States

Safak Yucel, Student, Duke University Durham, United States

We investigate the impact of pricing policy (i.e., flat pricing versus peak pricing) on renewable energy investments and carbon emissions. We find that flat pricing generally leads to a higher investment level and lower carbon emissions. We also study the effects of subsidy policies on the investments and emissions.

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Friday, 03:15 PM - 04:45 PM, Columbia 11

Track: Sustainable Operations

Session: Sustainability: An International Perspective

Chair(s): Anna Sanno

- 060-0241** Drivers for Implementing Environmental Requirements – An International Explorative Study within Manufacturing
Anna Sanno, Student, Mälardalen University, Sweden
Mats Deleryd, Professor, Mälardalen University, Sweden
Anders Fundin, Professor, Mälardalen University, Sweden

Manufacturing companies need to respond to a sustainable development facing the limitations of planet Earth. This paper explores driving forces for environmentally driven change by gathering interview data from 27 manufacturing plants in Europe and America. A proposed model connects external change triggers with needed change actions within organizations.

- 060-0498** The Role of National Culture on the Adoption of Sustainable Operations
Cristina Sancha, Student, Esade Business School, Spain
Annachiara Longoni, Assistant Professor, Esade Business School, Italy
Cristina Gimenez, Associate Professor, Esade Business School, Spain

Institutional and stakeholders pressures are described as drivers of sustainable operations. We believe that the adoption of sustainable practices is also contingent to the national culture of the firm. We investigate its role on the adoption of sustainable practices using data from an international survey combined with Hofstede's culture measures.

- 060-0099** Preliminary Investigation of Metrics Governing Continuous Descent Approach
Emad Alharbi, Student, New Jersey Institute of Technology, United States
Layek Abdel-Malek, Professor, New Jersey Inst of Technology, United States

Continuous Descent Approach (CDA); the advanced flight procedure for approaching aircraft for landing that promises environmental sustainability and operational benefits by reducing carbon footprints, noise levels around airports, and fuel consumption. This research analytically investigates the feasibility, appropriateness, and adaptability of CDA as relates to airports characteristics.

- 060-1038** The Management of International Environmental Law in Logistics Processes
Washington Luiz Soares, Student, UNISANTOS, Brazil
Julio Simões, Student, Coimbra, Brazil
Camila Lopes, Student, UNIMES, Brazil
Jessica Elise Soares, Student, UNISANTOS, Brazil
Jonathan Soares, Student, UNIMES, Brazil

The sustainable management of multimodality depends on public policies which in Brazil are not associated with the international legislation to transport practices with the environmental protection. The lack of infrastructure and bureaucracy of the interministerial structure prevents the Ministry of Environment developing a railway model by Modal Shift with containers.

96	Friday, 03:15 PM - 04:45 PM, Piscataway	<i>Track:</i> Inventory Management
	<i>Session:</i> inventory management 2	
	<i>Chair(s):</i> David Goldberg	

- 060-0522** Asymptotic Optimality of Tailored Base-surge Policies in Dual-sourcing Inventory Systems with Large Lead Times
Linwei Xin, Student, Georgia Institute of Technology, United States
David Goldberg, Assistant Professor, Georgia Institute of Technology, United States

Dual-sourcing inventory systems are notoriously difficult to analyze. Recently, so-called Tailored Base-Surge(TBS) policies have been analyzed in Allon and Van Mieghem (2010) and Janakiraman, Seshadri and Sheopuri (2014). Such TBS policies are conjectured to be asymptotically optimal as the lead time difference grows. We prove this conjecture in this work.

- 060-0690** Newsvendor Games with Risk-averse Players
Alejandro Toriello, Assistant Professor, Georgia Institute of Technology, United States
Nelson Uhan, Assistant Professor, United States Naval Academy, United States

In a newsvendor game, different retailers collaborate by placing a single order and must allocate resulting costs. We suppose retailers are risk-averse and employ coherent risk measures. We use a dynamic version of the core to show that collaboration may not be possible except when it is least beneficial.

- 060-1231** Time Consistency and Dynamic Formulations in Inventory Control
Linwei Xin, Student, Georgia Institute of Technology, United States
David Goldberg, Assistant Professor, Georgia Institute of Technology, United States
Alex Shapiro, Professor, Georgia Institute of Technology, United States

One approach to robust inventory control is to posit that nature selects a worst-case distribution for any relevant stochastic primitives from some pre-specified family. Such formulations can exhibit a phenomenon known as time-inconsistency. We provide several examples showing that related questions can be quite subtle, and discuss some time-consistent formulations.

- 060-1267** An Inventory Model with Supply Contracts
Tonghoon Suk, Student, Georgia Institute of Technology, United States
Ton Dieker, Associate Professor, Georgia Institute of Technology, United States

We introduce an inventory model with uncertain demand for an item that can be supplied at different price points depending on the length of the contractual commitment as measured by a reservation term. We set up an optimization problem for the inventory model and study online algorithms.

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Friday, 03:15 PM - 04:45 PM, Cardozo

Track: Information in Operations Management*Session:* Economics of Information Systems*Chair(s):* Hailiang Chen**060-0612** What Affects Software Development Project Performance in the Crowdsourcing Context?

Shun Ye, Assistant Professor, George Mason University, United States

Nirup Menon, Associate Professor, George Mason University, United States

This study examines the antecedents of software development project performance in the crowdsourcing context. We find that when a project is developed in phased contests, the outcome of each phase is positively influenced by the best outcome in previous phases. However, this effect decays over time.

060-1577 Does Bigger Screen Lead to More Cellular Data Usage?

Baojun Ma, Assistant Professor, Beijing University of Posts and Telecommunications, China

Hailiang Chen, Assistant Professor, City University of Hong Kong, Hong Kong

This study utilizes a terabyte dataset from a telecommunications company to examine the relationship between screen size and cellular data consumption for over 1 million tablet and phone users. Our findings can provide important implications for mobile network operators in promoting data plans to users with different devices (smartphones/tablets).

060-0228 IT Master Plan Effectiveness in Public Sector

Rosemeire Oikawa, Manager, Microsoft, Brazil

Napoleao Galeale, Professor, CEETEPS, Brazil

Getulio Akabane, Retired, CEETEPS, Brazil

Tereza Cristina Carvalho, Professor, University of Sao Paulo, Brazil

The paper aims to verify IT effectiveness based on descriptive survey and semi structured interviews in a municipal, state and federal agency in Brazil. It concluded that CISR/MIT methods used in the private sector can be also used in public sector.

98

Friday, 03:15 PM - 04:45 PM, Du Pont

Track: Humanitarian and Not-for-profit Operations*Session:* Procurement and inventory management decisions in not-for-profit settings*Chair(s):* Alexander Rothkopf**060-0244** Dual Sourcing Reproductive Health (RH) Commodities Considering Operational Risks and Competition

Alexander Rothkopf, Lecturer, University of Wuerzburg, Germany

In many RH commodity settings two large buyers face a single supplier. When a second generic supplier enters a difficult trade-off decision ensues between balancing operational risks added by a less reliable supplier and the competitive dynamics that may reduce prices.

060-0290 Drug Procurement with Long Term Considerations: Volume Splits and Volume Guarantees

Alexander Rothkopf, Lecturer, University of Wuerzburg, Germany

Eirini Spiliotopoulou, Assistant Professor, VU Amsterdam, Netherlands

Recently global health procurement organizations grant volume guarantees to existing suppliers, aiming to reduce prices through competition and higher economies of scale. However, volume commitments today affect market competition and new supplier entry in the future. Our analysis lends insights to policy makers into the optimal structure of such schemes.

060-0662 Horizontal Cooperation among Humanitarian Organizations in Inventory Management

Fuminori Toyasaki, Associate Professor, York University, Canada

Emel Arikan, Assistant Professor, Vienna University of Economics and Business, Austria

Lena Silbermayr, Assistant Professor, Vienna University of Economics and Business, Austria

Ioanna Falagara Sigala, Student, Vienna University of Economics and Business, Austria

Werner Jammerneegg, Professor, Vienna University of Economics and Business, Austria

Our study focuses on horizontal logistics cooperation among the humanitarian organizations in stock management that follows a service provider approach such as United Nation Humanitarian Response Depots (UNHRD) network. Our research seeks to explore the shared and back-up inventory system of the UNHRD network.

99

Friday, 03:15 PM - 04:45 PM, Embassy

Track: Humanitarian and Not-for-profit Operations*Session:* Pre-positioning and human capital issues in humanitarian operations*Chair(s):* Graham Heaslip**060-1207** Robust Optimization Network Models for Pre-positioning and Distribution of Emergency Relief Supplies

Joline Uichanco, Assistant Professor, University of Michigan Ann Arbor, United States

We develop a robust optimization model for pre-positioning under uncertainties in demand, arc capacities, and supply. We propose an approximation using geo-location clustering for the NP-hard problem. We also propose a model for fair post-disaster supply distribution and allocation of vehicles. We demonstrate our models on the Philippines' Typhoon Haiyan.

- 060-1389** GIS-based Decision Support Tool for Pre-positioning and Allocation of Disaster Relief Goods in the Philippines
Reinabelle Reyes, Assistant Professor, Ateneo de Manila University, Philippines
Justin Bolilia, , Ateneo de Manila University, Philippines
James Faeldon, R&D, IBM, Philippines
Vicente Reventar III, Lecturer, Ateneo de Manila University, Philippines

We develop a GIS-based decision-support tool to facilitate centralized planning for disaster response operations in the Philippines, driven by a robust optimization network model that prescribes fair schemes for pre-positioning and allocation of relief supplies and transportation vehicles. We discuss challenges and opportunities in adoption and implementation.

- 060-0111** Capability Framework: A Framework for Flexibility
Graham Heaslip, Associate Professor, University of New South Wales, Australia

Humanitarian organisations have adopted the T-shaped skills model when discussing the requisite skills for humanitarian logisticians. This paper argues that the T-shaped model is outdated and that a "Capability Framework" is needed for humanitarian organisations to become efficient and flexible.

- 060-1618** Delivering Humanitarian Assistance at the Last Mile of the Supply Chain: Insights on Recruiting and Training
Andrea Prado, Assistant Professor, INCAE, Costa Rica
Daniel Calderon, Student, INCAE, Costa Rica
Roy Zuniga, Professor, INCAE, Costa Rica

Humanitarian operations management research has focused on structural issues and resource allocation, but little is known about human resources delivering aid at the last mile of the supply chain. Our analysis yields insights into the way the organization can implement recruiting and training practices to work with BOP personnel

- 060-0333** Organisational Capacity Building to Support Operational Agility in the Field of Humanitarian Logistics
Cecile L'Hermitte, Student, Australian Maritime College / University of Tasmania, Australia
Peter Tatham, Professor, Griffith University, Australia
Marcus Bowles, Associate Professor, Australian Maritime College / University of Tasmania, Australia
Ben Brooks, Senior research fellow, Australian Maritime College / University of Tasmania, Australia

Business research demonstrates that agility transcends operations and requires a strategic approach. On this basis, we explore the contribution of 4 strategic level capabilities to agility in a humanitarian context. A qualitative analysis of 29 face-to-face interviews corroborates the importance of a strategic approach to agile humanitarian logistics operations.

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| 101 | Friday, 03:15 PM - 04:45 PM, Fairchild West | Track: Economics Models of Operations |
| | Session: Incentives, Efficiency and Sustainability | |
| | Chair(s): Sudheer Gupta | |

- 060-0007** Cooperative Promotions in the Distribution Channel
Salma Karray, Associate Professor, University of Ontario Institute of Technology, Canada

We study horizontal (HJP) and vertical (VJP) joint promotions in competing channels. Retailers HJP with decentralized and centralized structured partners is considered. We find that the profitability of HJP depends on the structure of the partnering channel. Also, HJP leads to changes in VJP rates that depend on competition levels.

- 060-0792** A Unified Efficiency Measurement for Environmental Assessment: A Network DEA Approach
Yu Yu, Student, Hehai University, China
Derek Wang, Assistant Professor, McGill University, Canada
Shanling Li, Professor, McGill University, Canada

We develop a network DEA model to combine the operational performance considering desirable outputs and environmental performance considering undesirable outputs in a unified approach. The key feature of this research is to convert single-stage DEA models into a two-stage network-like DEA model in order to capture more managerial insights.

- 060-1494** Extended Liability and Responsible Supply Chain Design
Sudheer Gupta, Associate Professor, Simon Fraser University, Canada

We study a strategic reason for branded marketers to outsource production to suppliers in other countries: to shirk legal liability in case of an adverse event which could pose social or environmental risks. We explore the concept of extended liability and its impact on promoting responsible supply chain practices.

- 060-1511** Managerial Process Improvement Incentives in a Supply Chain
Jasper Veldman, Assistant Professor, University of Groningen, Netherlands
Gerard Gaalman, Retired, University of Groningen, Netherlands

In monopolistic situations, the owner of a manufacturer firm will never use process improvement incentives to stimulate its manager to invest in cost reducing process improvement. We show that this conclusion does not necessarily hold in the Stackelberg case consisting of a supplier and a manufacturer.

102	Friday, 03:15 PM - 04:45 PM, Gunston East	<i>Track:</i> Meetings & Symposiums
	<i>Session:</i> Meet the Editors 1	
	<i>Chair(s):</i> Cheryl Gaimon Kalyan Singhal	

060-1694 Meet the Editors

Aleda Roth, Professor, Clemson University, United States

Kalyan Singhal, Professor, University of Baltimore, United States

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.

103	Friday, 03:15 PM - 04:45 PM, Gunston West	<i>Track:</i> Marketing and OM Interface
	<i>Session:</i> Sustainability in OM/Marketing interface	
	<i>Chair(s):</i> Karthik Murali	

060-0519 The Carbon Footprint of E-commerce: A Consumer Shopping Behavior Perspective

Dimitri Weidell, Student, EPFL, Switzerland

Edgar Blanco, Professor, Massachusetts Institute of Technology, United States

Tony Craig, Assistant Professor, Iowa State University, United States

Naoufel Cheikhrouhou, Professor, EPFL, Switzerland

This paper compares the carbon footprint of online vs. traditional retailing using different combinations of product attributes and consumer buying behavior. Our results show online shopping is generally most environmentally friendly, but as consumers leverage traditional brick-and-mortar alternatives to online buying behaviors some of the savings can quickly erode.

060-0880 Firm and Nonprofit Levers to Improve Supplier Environmental Performance

Ozgen Karaer, Assistant Professor, Middle East Technical University, Turkey

Tim Kraft, Assistant Professor, University of Virginia, United States

John Khawam, Manager, Google Inc., United States

GreenBlue is an nonprofit that develops science-based tools for industries. We investigate when and how GreenBlue should introduce to firms the use of a new tool that increases the transparency of the chemicals used in supply chains. We consider both supplier competition and development as ways to utilize the tool.

060-0852 Ecolabel Supply Chains: But Is It Green?

Eylem Koca, Assistant Professor, Fairleigh Dickinson University, United States

Gilvan Souza, Associate Professor, Indiana University, United States

In a game-theoretic setting incorporating ecolabel providers, manufacturers, retailers, and consumers, we investigate the drivers behind a variety of observations in the context of ecolabeling. We further study the implications our findings from a supply chain management perspective.

060-0369 The Impact of Eco-labeling on Green Product Lines

Karthik Murali, Student, University of Illinois Urbana-Champaign, United States

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

Nicholas Petruzzzi, Professor, University of Illinois Urbana-Champaign, United States

The use of ecolabels allows firms to convey credible information about environmental attributes in their products. We study the role of a firm's credibility and certification from external agencies on a firm's ecolabeling choices and its consequences from a triple bottom line perspective in a competitive setting.

104	Friday, 03:15 PM - 04:45 PM, Coats	<i>Track:</i> Retail Operations Management
	<i>Session:</i> Empirical Retail Operations	
	<i>Chair(s):</i> Antonio Moreno-Garcia Santiago Gallino	

060-0190 Competitive and Collaborative Implications of Category Captainship: An Empirical Investigation

Yasin Alan, Assistant Professor, Vanderbilt University, United States

Jeffrey Dotson, Associate Professor, Brigham Young University, United States

Mumin Kurtulus, Associate Professor, Vanderbilt University, United States

We empirically examine the impact of a category captainship implementation performed by a large U.S. grocer on various parties involved, including the retailer, the captain, and the competing manufacturers. Our findings verify some of the hypotheses developed in the relevant theoretical literature and refute others.

060-0442 The Value of Fit Information in Online Retail: A Randomized Field Experiment

Antonio Moreno-Garcia, Assistant Professor, Northwestern University, United States

Santiago Gallino, Assistant Professor, Dartmouth College, United States

Traditional brick-and-mortar and online retail channels differ in how they accomplish the two most fundamental channel functions: delivering information and fulfilling transactions. This paper focuses on the importance and the impact of providing accurate product fit information in online apparel retail.

060-0615 Estimating Product Substitution and Basket Abandonment Effects in Retail Stores

Vidya Mani, Assistant Professor, Penn State University University Park, United States

Doug Thomas, Professor, Penn State University University Park, United States

Saurabh Bansal, Assistant Professor, Penn State University University Park, United States

We analyze transaction data from an office supplies retail chain and estimate product substitution and basket abandonment effects at downsized stores. We show that incorporating these effects in assortment planning for downsized stores can significantly improve sales at these stores.

060-1067 Management of Effective Shelf Lives

Arzum Akkas, Student, Massachusetts Institute of Technology, United States

Vishal Gaur, Professor, Cornell University, United States

Roy Welsch, Professor, Massachusetts Institute of Technology, United States

David Simchi-Levi, Professor, Massachusetts Institute of Technology, United States

Product shelf lives erode in the supply chain. Sometimes, it is more profitable for manufacturers to write-off aged inventory instead of selling the product to retailers due to expiration cost. In this research, using shipment data for 3025 stores, we calculate optimum targets for effective shelf lives for the manufacturer.

105

Friday, 03:15 PM - 04:45 PM, Monroe

Track: Meetings & Symposiums

Session: Doctoral Consortium 2

Chair(s): Rachna Shah

060-1701 Doctoral Consortium 2

Rachna Shah, Associate Professor, University of Minnesota, 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.

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Friday, 03:15 PM - 04:45 PM, Holmead East

Track: Manufacturing Operations

Session: Lean Operations

Chair(s): Carlos Ernani Fries

060-1355 Application of Lean Line Feeding for Increasing Productivity: A Case Study

Vicente Sinkunas, Student, Centro Paula Souza, Brazil

Gilberto Mourao, Student, Centro Paula Souza, Brazil

Julia Barreto, Student, Centro Paula Souza, Brazil

Getulio Akabane, Retired, CEETEPS, Brazil

Hamilton Pozo, Retired, Centro Paula Souza, Brazil

This article presents how the application of lean logistics principles to the line feeding of an assembly line contributed to the increase of productivity in a new truck plant in Brazil. A qualitative assessment on the shopfloor identified a set of effective improvements and better results.

060-0696 A Lean Implementation Sequence to Achieve Performance Excellence

Thomas Bortolotti, Lecturer, Swansea University - School of Management, United Kingdom

Barbara Flynn, Professor, Indiana University, United States

Niall Piercy, Professor, Swansea University - School of Management, United Kingdom

Nick Rich, Professor, Swansea University - School of Management, United Kingdom

What is the role of lean management in building and sustaining a cumulative competitive advantage? Based on a systematic literature review, the authors propose a theoretical framework that highlights the sequence of implementation of the lean bundles of practices, and the relationships between lean practices and operational performances.

060-1365 An Optimization Engine for Machine Layout in Cellular Manufacturing

Sergio Fernando Mayerle, Associate Professor, Federal University of Santa Catarina, Brazil

Carlos Ernani Fries, Associate Professor, Federal University of Santa Catarina, Brazil

Ivan Ludgero Ivanqui, Associate Professor, Centro Universitario Municipal de Sao Jose, Brazil

Rafael Dutra Mayerle, Engineer, Petrobras, Brazil

This paper proposes a general approach for the machine layout problem in cellular manufacturing with minimization of number of machines and transport time between cells. The optimization engine considers the sequential application of mixed integer programming models supported by genetic algorithms to solve them. Results of several cases are provided.

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Friday, 03:15 PM - 04:45 PM, Holmead West

Track: Product Innovation and Technology Management

Session: Organizational Issues in NPD

Chair(s): Juan Madiedo

060-0500 Using Stage-gate Contracts to Screen an Agent with Inside Information

Chunlin Wang, Student, University of Utah, United States

Glen Schmidt, Professor, University of Utah, United States

Bo van der Rhee, Professor, Nyenrode University, Netherlands

We explore how a principal should formulate an outsourcing contract for a New Product Development project to an agent whose effort is unobservable (moral hazard) and who has inside information (adverse selection) in the context of a stage-gate project involving a go/no-go decision at each of two stages.

060-1184 Asymmetrical Joint Action Expectations, Interoperability and Innovation Performance

Hugo DeCampos, Assistant Professor, Wayne State University, United States

John Ettlie, Professor, Rochester Institute of Technology, United States

Steve Melnyk, Professor, Michigan State University, United States

Using empirical data from a survey of auto industry R&D projects, we use SEM to test the relationship between asymmetrical joint action expectations (AJAE), interoperability and innovation performance. Results support the hypothesized link between behavioral interoperability and performance. Additionally, AJAE is confirmed as relevant to behavioral interoperability.

060-0152 Multilevel Learning and Performance: The Interplay between Managers and Engineers

Juan Madiedo, Student, IE Business School, Spain

Aravind Chandrasekaran, Assistant Professor, Ohio State University, United States

Fabrizio Salvador, Professor, IE Business School, Spain

Despite recent advances in multilevel learning literature, our understanding of the effects of combining different sources of experience remains limited. Based on a data set of over 4000 software maintenance tasks, this study examines the interplay between managers and engineers, as sources of experience, and its effect on task performance.

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Friday, 03:15 PM - 04:45 PM, Kalorama

Track: Closed Loop Supply Chains

Session: Barriers, Pricing, and Management of Closed-Loop Supply Chains

Chair(s): Marta Jakowczyk

060-0854 One Size Doesn't Fit All – Understanding Barriers to Product Remanufacturing

Marta Jakowczyk, Student, University of Manchester, United Kingdom

João Quariguasi, Lecturer, University of Bath, United Kingdom

Jens Roehrich, Assistant Professor, University of Bath, United Kingdom

Based on 16 interviews with manufacturers and independent remanufacturers of EEE, medical systems and aircraft engines we (i) examine the barriers to the functioning of product remanufacturing and (ii) draw on RBV and institutional theory to explain how such barriers vary across remanufacturers in different sectors.

060-0006 Pricing Decision of Remanufacturing Considered Product Disassemblability

Juhong Gao, Associate Professor, Tianjin university, China

The Closed-loop Supply Chain model consisting of OEM and IO was constructed. The decisions of pricing and product disassemblability strategies were studied. The impact of roduct disassemblability strategies on profits of members in CLSC was analyzed. The coordination of revenue sharing contract with decentralized decision was investigated.

060-0953 Modelling and Simulating Flexibility in Reverse Enterprise System

Jitendra Madaan, Assistant Professor, Indian Institute of Technology Delhi, India

This paper addresses these critical issues and proposes a novel integrated and Flexible Reverse Enterprise System (FRES) decision model. The proposed model aims to facilitate enterprises in assessing their returns handling capability, and in improving overall performance. The proposed model is a natural extension of several well-grounded policies for conventional reverse supply chains and can be verified on a simulation platform.

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Friday, 03:15 PM - 04:45 PM, Jay

Track: Purchasing and Supply Management

Session: Buyer-Supplier Relationship Management Solutions

Chair(s): WC Benton

060-0475 Does Supply Chain Integration Increases Supply Chain Disruption Intensity?

Siddharth Rastogi, Student, Department of Management Sciences, Fisher College of Business, United States

WC Benton, Professor, Ohio State University, United States

Supply Chain Integration (SCI) has been touted for its many benefits. This paper explores whether or not SCI increases the frequency and severity of disruptions in the SC. Specifically, this paper explores whether this relationship is mediated by firm's SC coupling, firm's SC redundancy or firm's SC agility.

060-0176 Estimating the Net Demand Distribution for Determining Core Acquisition Quantities in a Rolling Horizon

Toyin Clotley, Assistant Professor, Iowa State University, United States

WC Benton, Professor, Ohio State University, United States

In this study we determine how Bayesian estimation of the net demand distribution for end-of-use products (i.e., cores) can be used to create multi-step ahead forecasts for purchasing decisions made over a rolling horizon. We also investigate the cost implications, under prescribed service levels, for varying degrees of misspecification.

060-1180 The Financial Impacts of Power and Embeddedness in Major Customer Networks

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

Network researchers argue that a firm's economic behavior and outcome are influenced by relational and structural embeddedness which concern the strength and the architecture of relationships. This study explores how a supplier's profitability is affected by its relational and structural embeddedness in networks of power-unbalanced relationships with major customers.

060-0440 Managing Outsourcing Relationships

Keith Skowronski, Student, Ohio State University, United States

WC Benton, Professor, Ohio State University, United States

We empirically investigate two distinct types of the hidden costs of outsourcing in manufacturing buyer-supplier relationships, shirking and poaching. Antecedents are developed by using theoretical insights from resource dependence theory, transaction cost economics and relationship management. Specifically, we examine if antecedents of supplier shirking are also antecedents of supplier poaching.

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Friday, 03:15 PM - 04:45 PM, Morgan

Track: Supply Chain Management

Session: Supply Chain Network Design I

Chair(s): Tomás Harrington

060-0082 Davinc3i: Towards Collaborative Responsive Logistics Networks in Floriculture

Jack van der Vorst, Professor, Wageningen University, Netherlands

Marlies De Keizer, Lecturer, Wageningen University, Netherlands

Presents business cases from the DaVinc3i project (2011-2015) that aimed to strengthen the international leading position of the Dutch horticulture sector in a global, virtualized trade network by researching the opportunities for innovative logistics coordination, consolidation and collaboration concepts in extended international trade networks (see www.davinc3i.com).

060-0292 A Study on Location Problem in the Environment of Cluster Supply Chain

Fahui Chong, Student, Peking University, China

Lihua Chen, Professor, Peking University, China

Zhaowei Hao, Student, Peking University, China

Based on the Chinese Cluster Supply Chain phenomenon, this article studies the spatial competition issue from the perspective of supply chain. Besides working out the interior location equilibrium, this article analyses the impact of several factors including the suppliers' concentration degree on the downstream's location behavior.

060-0317 Network Distance and Information Access in New JV Formations

Steven Carnovale, Assistant Professor, Portland State University, United States

Sengun Yenyurt, Associate Professor, Rutgers University, United States

Extant research suggests that network structure directly impacts the likelihood of being chosen for a Joint-Venture. Research hasn't yet examined network structure through the lens of information-access its impact on new JV-formations. Herein we examine the role of hubs, authorities and reach centrality and their role in new JV formations.

060-0356 Emerging Product-process Archetypes in Oncology: Implications for Supply Network Design

Tomás Harrington, Associate Professor, Cambridge University, United Kingdom

Accelerated growth of the oncology market, within the pharmaceutical sector, has been widely reported in the literature e.g. predicted spends of \$74-84 Billion by 2017, making oncology the leading therapeutic area. A series of emerging product-process archetypes and associated implications for future supply models in oncology are explored.

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Friday, 03:15 PM - 04:45 PM, Northwest

Track: Production Planning and Scheduling

Session: Recent Advances in Operations Management

Chair(s): Zhi-Long Chen

060-0784 Collaborative Scheduling for Quay Crane Dual Cycling in Container Terminals

Yujiao Sun, Student, Dalian University of Technology, China

Xiangpei Hu, Professor, Dalian University of Technology, China

Quay crane dual cycling, which has proved to be of high economical and environmental advantages, is a new collaborative method to schedule different types of handling equipment in container terminals. We explore how the operation sequences can influence the setup cost using a mixed-integer programming model and a heuristic method.

060-0719 Reverse Logistics Program Quality

Haozhe Chen, Associate Professor, East Carolina University, United States

Reverse logistics' importance in supply chain management has gained increasing recognition in recent years and more companies are developing related programs. This study uses empirical survey data to develop a measurement of Reverse Logistics Program Quality and explore its potential drivers.

060-1140 An Agenda for Project Management Research

Nicholas Hall, Professor, Ohio State University, United States

The talk, supported by published papers, describes an agenda for project management research. The practice of project management, especially for critical chains and agile, has moved ahead of the state of research knowledge. We discuss specific research developments that are needed to validate and extend methodologies already used in practice.

060-1513 Two Dimensional Load Balancing

Kangbok Lee, Assistant Professor, York College, United States

Joseph Leung, Professor, New Jersey Inst of Technology, United States

Michael Pinedo, Professor, New York University, United States

We consider a bi-criteria parallel machine scheduling problem in which the first objective is the minimization of the makespan of the schedule and the second objective is the minimization of the maximum machine cost. We propose a fast heuristic and derive its worst-case performance bound.

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Friday, 03:15 PM - 04:45 PM, Oak Lawn

Track: Risk Management in Operations

Session: Managing Uncertainties in Supply Chains

Chair(s): Xiao Huang Mehmet Gumus

060-0199 How Fast Should a Cash Constrained Firm Grow? Strategies That Balance Growth and Survival

Yasin Alan, Assistant Professor, Vanderbilt University, United States

Vishal Gaur, Professor, Cornell University, United States

A cash-constrained firm has to balance growth and survival when making its operational and financial decisions. We study the operational implications of this trade-off in a finite horizon cash-constrained inventory model with non-stationary demand, which is a function of the firm's past order quantities.

060-0754 Newsvendor Mergers

Soo-Haeng Cho, Associate Professor, Carnegie Mellon University, United States

Xin Wang, Student, Carnegie Mellon University, United States

We examine the effects of a merger between two price-setting newsvendors on firms' prices, inventories and expected profits. In contrast to the celebrated result obtained under deterministic demand, we find that merger synergies neither from statistical economies of scale nor from conventional economies of scale always benefit consumers under uncertainty.

060-0883 Mitigating Supply Uncertainty: The Interplay between Diversification and Pricing

Tao Li, Assistant Professor, Santa Clara University, United States

Suresh Sethi, Professor, University of Texas Dallas, United States

Jun Zhang, Professor, Fudan University, China

We consider a firm's sourcing problem from unreliable suppliers in two price setting scenarios: committed and responsive pricing. We show that supply diversification and responsive pricing are not necessarily substitutes. The relationship between these two strategies depends on two adverse effects caused by supply uncertainty: lost-revenue effect and lost-goodwill effect.

060-1213 Wine Analytics: Fine Wine Pricing and Selection under Weather and Market Uncertainty

Mert Hakan Hekimoglu, Student, Syracuse University, United States

Burak Kazaz, Associate Professor, Syracuse University, United States

Scott Webster, Professor, Arizona State University Tempe, United States

We investigate a distributor's portfolio selection problem of fine wine futures and bottles. Using Liv-ex.com data, we empirically show how young wine prices can be predicted by changes in weather and market conditions. We then examine the distributor's investment decisions in futures, bottles, and cash position using a Value-at-Risk measure.

060-1665 The Value of Audit in Managing Supplier's Process Improvement

Mehmet Gumus, Associate Professor, McGill University, Canada

Mohammad Nikoofal, Assistant Professor, Catolica Lisbon School of Business & Economics, Palma de Cima, Portugal

Besides the benefits of outsourcing, firms are concerned about the lack of information regarding their suppliers. Moreover, suppliers may take certain actions that affect their supply risks without informing their buyers. We study the effectiveness of incentive- and audit-based contracts in dealing with such suppliers.

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Friday, 03:15 PM - 04:45 PM, Parlor A

Track: General Track

Session: Decision Support for Operations

Chair(s): Margaret Shipley

060-1191 Decision Support Model for the Selection of Projects

Alexandre Massote, Professor, Centro Universitario Da Fei, Brazil

Marcelo Paiva, Director, Centro Universitario Da Fei, Brazil

This paper presents a mathematical model for the selection of investments alternatives in improvements projects, looking for maximizing the EBIT index, based on the inter-relationship and hierarchy of metrics, allowing managers to view the best results for the organization, with the criterion maximizing the financial index EBIT.

060-1599 A Fisheries Swarm Intelligence Model Directed Theoretically towards SME Sustainability

Margaret Shipley, Professor, University of Houston Downtown, United States

Jennifer Shipley-Lozano, Senior Research Biologist-Artificial Reef Program, Texas Parks and Wildlife, United States

Faiza Khoja, Associate Professor, University of Houston Downtown, United States

As fish survival is dependent upon energy expended to avoid predation so are the strategies of small to mid-size enterprises (SMEs) directed toward avoiding the "big-fish" takeover. Transitioning natural science environmental decision-making to models for business organizational operations utilizing swarm intelligence may lead to improving sustainability of SMEs.

060-1319 Meta-analysis of ERP System Impact on Firm Performance

Dennis Jamrose, Student, Suny At Buffalo, United States

Nallan Suresh, Professor, Suny At Buffalo, United States

ERP systems have been implemented in many types of organizations. However, the extent these systems impact organizational performance is unclear. We review past empirical research to identify common sources of benefit creation from implementing an ERP system and address previous inconsistent findings by conducting a meta-analysis on secondary financial measures.

060-0900 Assessing City Readiness for Implementing Urban Freight Transportation Strategy

Lindawati Lindawati, Reader, The Logistics Institute - Asia Pacific, Singapore

Robert De Souza, Professor, The Logistics Institute - Asia Pacific, Singapore

Busy cities face great challenges in planning and developing an efficient and sustainable urban transportation system for both freight and people. This paper studies the city readiness for implementing urban freight transportation strategy in its local programs. We report findings based on interviews of representatives of five cities in Indonesia.

060-1717 Development of the Mobile Application and Operation System for Real-time Management of Subassembly Stock Areas

Bonseok Koo, Researcher, Hyundai Heavy Industry Co., Korea, Republic of (South Korea)

Soon-Ik Hong, Lead Researcher, Hyundai Heavy Industry Co., Korea, Republic of (South Korea)

Sang-Hyup Lee, Principal Researcher, Hyundai Heavy Industry Co., Korea, Republic of (South Korea)

Seung Jin Ha, Principal Researcher, Hyundai Heavy Industry Co., Korea, Republic of (South Korea)

Sung-Woo Cho, Researcher, Hyundai Heavy Industry Co., Korea, Republic of (South Korea)

Recently, most companies in manufacturing take advantage of real-time data to improve productivity and logistics efficiency. The purposes of this study are to define application method and GUI design of mobile program for real-time data gathering and to introduce mobile-based operation system for real-time management of subassembly stock area.

116	Friday, 03:15 PM - 04:45 PM, Columbia 5-8	Track: Meetings & Symposiums
	Session: Semi-Plenary on Relevance, Healthcare Operations College: Hospital Payment Trends and Alignment with Quality Care	
	Chair(s): David Dobrzykowski Linda LaGanga	

060-1710 Hospital Payment Trends and Alignment with Quality Care

Priya Bathija, Senior Associate Director, Policy, American Hospital Association, United States

Akinluwa Demehin, Senior Associate Director, Policy, American Hospital Association, United States

David Dobrzykowski, Assistant Professor, Rutgers University, United States

Linda LaGanga, Director of Quality Systems & Operational Excellence, Mental Health Center of Denver, United States

Vikram Tiwari, Assistant Professor, Vanderbilt University, United States

Presenters from the American Hospital Association explain current and emerging payment approaches and their effect on delivery of high-quality healthcare. Incentives for hospitals and their providers and their alignment with desired results for patients will be discussed, then we will interview presenters for their recommendations and facilitate a question-and-answer session.

Friday, 05:00 PM - 06:30 PM

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Friday, 05:00 PM - 06:30 PM, Columbia 1

Track: Behavior in Operations Management

Session: Behavioral Operations Management & Revenue Management

Chair(s): Yang Zhang

060-0264 Newsvendor Problem in the Presence of Strategic Consumers: Theory & Evidence

Yang Zhang, Assistant Professor, Tsinghua University, China

Benny Martin, Assistant Professor, University of Waterloo, Canada

When facing customers who may strategically delay their purchases to the salvage season for lower prices, the newsvendor should order less than the conventional optimum, in order to signal a shortage of products so that strategic customers herd into purchases in the normal selling season.

060-1496 Social Network Effects on Strategic Interactions: A Laboratory Approach

Yang Zhang, Assistant Professor, Tsinghua University, China

We examine how the social network structure leverages the outcome of collective activities and fosters socially beneficial behavior in strategic contexts. We find that subjects' behavior is strongly influenced by characteristics of their local networks, rather than the global network, and explain our findings through a hybrid learning model.

060-0799 Bounded Rationality and Learning in the Economic Order Quantity Setting

Kay yut Chen, Professor, University of Texas Arlington, United States

Yan Wu, Associate Professor, University of Kansas, United States

Existing behavioral OM literature focuses on stationary environments. We extend the EWA model to capture individuals' learning behavior in changing but "similar" environments. The model is applied to an EOQ setting where the costs are changing and we shows that this "learning from similar experience" effect is significant.

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Friday, 05:00 PM - 06:30 PM, Columbia 2

Track: Supply Chain Management

Session: College of SCM Student Paper Competition II

Chair(s): Vinayak Deshpande

060-1726 Remanufacturing and Trade-in Program under Strategic Customer Behavior

Renyu Zhang, Student, Washington University St Louis, United States

Fuqiang Zhang, Associate Professor, Washington University St Louis, United States

We study the impact of remanufacturing and trade-in programs on a firm's profit, the environment, and social welfare. We show that the adoption of remanufacturing may have a negative impact on the environment. Similarly, some widely applied government subsidies may also aggravate the detrimental impact of production on the environment.

060-1723 Competition and Externalities in Green Technology Adoption

Charles Thraves, Student, Massachusetts Institute of Technology, United States

Maxime Cohen, Student, Massachusetts Institute of Technology, United States

Georgia Perakis, Professor, Massachusetts Institute of Technology, United States

We study the effects of competition among multiple suppliers who sell green technology products. The government offers consumer subsidies to encourage the product adoption. We quantify how competition impacts the consumers, the suppliers as well as the government. We validate our insights using actual data from the electric vehicle industry.

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Friday, 05:00 PM - 06:30 PM, Columbia 3

Track: Empirical Research in Operations Management

Session: Empirical Research - Consumers and Customers

Chair(s): Bob Batt

060-0441 Dynamic Pricing in Online Retailing: Evidence from Field Experiments and an Implementation

Jun Li, Assistant Professor, University of Michigan Ann Arbor, United States

Santiago Gallino, Assistant Professor, Dartmouth College, United States

Marshall Fisher, Professor, University of Pennsylvania, United States

We estimate an empirical model capturing consumer choices among substitutable products from multiple retailers. Based on the estimates, we propose a best-response pricing strategy that takes into account consumer choice behavior, competitors' actions, and supply parameters. We test our algorithm through a carefully controlled live experiment.

060-1190 Improving Operations Security in Retail: A High Reliability Perspective

Hung-Chung Su, Assistant Professor, Wisconsin-White Water, United States

Kevin Linderman, Professor, University of Minnesota, United States

Johnny Rungtusanatham, Professor, Ohio State University, United States

Christopher Swanton, Assistant Professor, College of Charleston, United States

Security issues such as shoplifting and employee theft cost retailers billions annually. We examine potential factors to improve retail security from a high reliability perspective. A survey was conducted and secondary measures were collected from a retailer.

060-0877 Consumer Behavior in Pay-per-Bid Auctions

Pranav Jindal, Assistant Professor, Penn State University University Park, United States
Anthony Kwasnica, Professor, Penn State University University Park, United States
Peter Newberry, Assistant Professor, Penn State University University Park, United States
Christopher Parker, Assistant Professor, Penn State University University Park, United States

In pay-per-bid/penny auctions bidders pay a fixed cost to increment the bid price by a small amount. We examine dynamic bidding behavior and learning in this auction model using a proprietary dataset of over 1 billion bids placed in a five-year period by more than 2.2 million users.

060-1227 Investigating the Merger-customer Service Relationship in the Airline Industry

Amirhossein Alamdar Yazdi, Student, Isenberg School of Management, United States
Adams Steven, Assistant Professor, University of Massachusetts Amherst, United States

We analyze the effect of the recent mergers in the airline industry on service quality. This is largely an ignored aspect of mergers particularly in OM. Our study extends the existing merger literature by incorporating service level into capacity and pricing effects of the consequent concentration of service providers.

120	Friday, 05:00 PM - 06:30 PM, Columbia 4	Track: Manufacturing Operations
	Session: Efficiency and Quality	
	Chair(s): Herwig Winkler	

060-0138 Manufacturing System's Efficiency Valuation Capturing the Impact of Inefficiencies from Inventory and Bad Quality

Gottfried Seebacher, Assistant Professor, University of Klagenfurt, Austria
Bernhard Oberegger, Assistant Professor, University of Klagenfurt, Austria
Herwig Winkler, Professor, University of Klagenfurt, Austria

We provide a novel approach for the holistic valuation of efficiency in manufacturing. Our model includes the valuation of both machining and internal transport efficiency. Additionally, we capture the efficiency losses that arise from excessive inventory and bad quality in manufacturing. As a result, we calculate the overall system's efficiency.

060-0663 Long-run Quality Performance Dynamics and Quality Cost Changes – New Empirical Evidence

Markus Plewa, Student, Friedrich-Alexander Universitat Erlangen-Nurnberg, Germany
Gernot Kaiser, Professor, Nordhausen University of Applied Sciences, Germany
Evi Hartmann, Professor, Friedrich-Alexander Universitat Erlangen-Nurnberg, Germany

Dynamics in quality performance and quality cost have been discussed extensively in the Total Quality Management literature. However besides anecdotal findings from case studies and simulation exercises little empirical evidence is available. Using unique secondary data we set out to clarify the dynamic mechanics between quality cost and quality performance.

060-0899 Product Modularization: Reality or Illusion? Empirical Evidence from a Case in a Coach Assembly Plant

Fabio Piran, Student, UNISINOS, Brazil
Daniel Lacerda, Associate Professor, UNISINOS, Brazil
Luis Felipe Camargo, Assistant Professor, UNISINOS, Brazil
Luis Rodrigues, Professor, UNISINOS, Brazil

Literature regarding product modularization indicates the possibility of improvement in operations performance. Nevertheless, empirical evaluations show that this expectation has rather limited evidence. In this context, the effects of modularization on the technical efficiency of operations and product engineering have been evaluated in a coach plant, through the DEA model.

060-0186 Conceptual Considerations for a Real Time Supply Chain Efficiency Monitoring

Herwig Winkler, Professor, University of Klagenfurt, Austria
Clemens Kuss, Assistant Professor, University of Klagenfurt, Austria

A recent simulation study proved that the efficiency of supply chains is highly volatile due to different influences. Therefore, we elaborated a model to evaluate supply chain efficiency. In our contribution we will show results of a case study and present considerations for a real time efficiency monitoring.

121	Friday, 05:00 PM - 06:30 PM, Columbia 9	Track: Scheduling and Logistics
	Session: Concepts and Opportunities in Scheduling and Logistics	
	Chair(s): Stephane Collignon	

060-1589 Opportunities for Innovation in Transportation: Experiences from the Canadian Resources Sector

Kalinga Jagoda, Associate Professor, Mount Royal University, Canada
Carlos Rojas, Student, Mount Royal University, Canada

The recent decline in oil prices and less than expected economic growth in manufacturing sector forced companies to find new ways to reduce their operating costs. This paper investigates the innovative approaches deployed by the Canadian mining firms to reduce their transportation costs and explores opportunities for improvement.

060-0785 Green Logistics as Urban Transportation Category

Débora Tavares, Student, Federal University of Uberlândia - UFU, Brazil
Luciana Cezarino, Assistant Professor, Federal University of Uberlândia - UFU, Brazil
Tania Teixeira, Associate Professor, Federal University of Uberlândia - UFU, Brazil

Michelle Carrijo, Assistant Professor, Federal University of Uberlândia - UFU, Brazil

The aim of this paper is investigate green logistics as previewed determined theory categories. By bibliographic research the study presents, describes and relates the concept of green logistics approaching theory and practices analyses with urban transportation categories. The results show that green logistics is less associated than expected.

- 060-1257** A Content Analysis of Transportation Procurement E-marketplaces
Stephane Collignon, Student, Virginia Polytechnic Institute And State University, United States
Deborah Cook, Professor, Virginia Polytechnic Institute And State University, United States
Tabitha James, Associate Professor, Virginia Polytechnic Institute And State University, United States

We performed a content analysis on transportation procurement websites, basing the analysis on an investigation of more than 350 websites. The study results in a categorization of transportation e-marketplaces based on participants, market targeted, and website structure (e.g. available trust building tools). Additionally, we discuss features unique to transportation e-marketplaces.

122	Friday, 05:00 PM - 06:30 PM, Columbia 10	<i>Track:</i> Sustainable Operations
	<i>Session:</i> Socially Impactful Operations: Managing health care systems in Low-Resource Settings	
	<i>Chair(s):</i> Karthik V. Natarajan	

- 060-1394** Demand vs. Supply-side Investment in Humanitarian Operations
Karthik V. Natarajan, Assistant Professor, University of Minnesota, United States
Jayashankar Swaminathan, Professor, University of North Carolina, United States

Both supply- and demand-side constraints impact program coverage in humanitarian settings. We first study the problem of identifying the optimal mix of supply- and demand-side investments faced by a budget-constrained organization in a centralized setting. We then consider a decentralized setting and identify the optimal performance-based contract to mobilize demand.

- 060-1507** Delivering Surgical Care to Underserved Communities: Development of a Theoretical Framework through Multi-method Triangulation
Emily Kohnke, Assistant Professor, Iowa State University, United States
Kingshuk Sinha, Professor, University of Minnesota, United States
Ujjal Mukherjee, Student, University of Minnesota, United States

This paper develops an integrative theoretical framework to inform the delivery of health-care in under-served communities. A detailed field study demonstrates that three drivers of demand for health-care innovations are affordability, awareness, and access. We also derive the inter-relationship between the three drivers through grounded study supported by empirical triangulation.

- 060-1116** Enhancing Environmental Sustainability of Healthcare: A System Dynamics Approach
Salman Shehab, Student, Brunel Business School, Bahrain
Afshin Mansouri, Senior Lecturer, Brunel University, Great Britain
Virginia Spiegler, Lecturer, Brunel University, United Kingdom

Healthcare administrations are facing great challenges to maintain sustainable healthcare and fulfil sector commitments toward climate change. To overcome this problem, new energy management frameworks need to be developed comprising sustainable strategies without compromising service level. Through a systematic literature review, system dynamics model is developed including significant contributory elements.

123	Friday, 05:00 PM - 06:30 PM, Columbia 11	<i>Track:</i> Sustainable Operations
	<i>Session:</i> Opportunities for Emissions Reductions	
	<i>Chair(s):</i> Suresh Muthulingam	

- 060-0314** Beyond Benchmarking: Finding and Implementing Emission Reduction Opportunities
Christian Blanco, Student, UCLA, United States
Felipe Caro, Associate Professor, University of California Los Angeles, United States
Charles Corbett, Professor, UCLA, United States

Using publicly available climate change-related surveys from over 5,000 firms with the largest global market capitalization, we investigate the relationship between carbon benchmarking and finding emission reduction opportunities.

- 060-0384** Online Intermediaries for Coordinating Surplus Chains
Suvrat Dhanorkar, Student, University of Minnesota, United States
Karen Donohue, Associate Professor, University of Minnesota, United States
Kevin Linderman, Professor, University of Minnesota, United States

Online Material & Waste Exchanges (OMWEs) provide online channels to repurpose by-products, unused materials and waste from industrial and commercial facilities. We analyze transactional data from MNExchange.org to examine the drivers of efficiency on OMWEs.

- 060-0436** An Empirical Investigation of Emissions Reductions under Changing Assessments of Hazard
Wayne Fu, Student, Georgia Institute of Technology, United States
Basak Kalkanci, Assistant Professor, Georgia Institute of Technology, United States
Ravi Subramanian, Associate Professor, Georgia Institute of Technology, United States

Governmental organizations such as the CDC provide extensive public information on potential hazards of industrial chemicals. We investigate facility-level emissions reductions of chemicals in relation to changes in their assessments over time. We also examine the effects of important external and internal factors such as competition and operational leanness.

- 060-0526** Impact of Take-back Regulation on the Remanufacturing Industry
Gokce Esenduran, Assistant Professor, Ohio State University, United States
Eda Kemahlioglu-Ziya, Assistant Professor, North Carolina State University, United States
Jayashankar Swaminathan, Professor, University of North Carolina, United States

In an industry where an independent remanufacturer competes with an OEM in the remanufacturing market, we analyze the impacts of regulating the market by imposing collection and reuse targets on the OEM. Using a stylized model, we identify the impacts of higher targets on remanufacturing, consumer surplus and total welfare.

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| 125 | Friday, 05:00 PM - 06:30 PM, Piscataway | <i>Track:</i> Production Planning and Scheduling |
| | <i>Session:</i> Recent Advances in Vehicle Routing | |
| | <i>Chair(s):</i> Ibrahim Capar | |
| | | |

- 060-1137** Periodic Vehicle Routing with Inventory Considerations
Bhupesh Shetty, Student, University of Iowa, United States
Jeffrey Ohlmann, Associate Professor, University of Iowa, United States

We study the problem of designing the inbound supply routes for a manufacturing plant to minimize transportation and inventory costs. We consider a routing plan that is periodic and supports pickup amounts that are proportional to the amount of time between visits. We develop a heuristic and present computational results.

- 060-0691** Joint Scheduling of Fresh-food Order Picking and Batch Delivery under B2C Mode in China
Xiaochun Feng, Student, Dalian University of Technology, China
Xiangpei Hu, Professor, Dalian University of Technology, China

We consider the joint scheduling of fresh-food order picking and batch delivery under B2C mode in China. A Joint optimization mathematical model and a double-clustering-SA genetic algorithm are presented to minimize the overall picking and delivery cost. Finally, a numerical analysis is conducted to verify our work's effectiveness.

- 060-1058** The Split Delivery Min-max Multi-depot Vehicle Routing Problem with Minimum Delivery Amounts
Xingyin Wang, Student, University of Maryland, United States
Bruce Golden, Professor, University of Maryland, United States
Edward Wasil, Professor, American University, United States

The objective of the split delivery min-max multi-depot vehicle routing problem with minimum delivery amounts is to minimize the maximum duration (sum of travel time and service times) of the routes. Each visit must deliver a minimum fraction of the total service. We develop a heuristic that produces high-quality results.

- 060-1482** Online and Open Vehicle Routing Problem with Split Delivery
Ibrahim Capar, Student, University of Alabama Tuscaloosa, United States
Burcu Keskin, Associate Professor, University of Alabama Tuscaloosa, United States

We consider an online, open vehicle routing problem with split deliveries. This type of problem is common for shippers that use common carriers with TL, LTL, or container services. We develop an integer programming based online optimization model to minimize long run total transportation cost.

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| 126 | Friday, 05:00 PM - 06:30 PM, Cardozo | <i>Track:</i> Information in Operations Management |
| | <i>Session:</i> IT Investment and Innovation | |
| | <i>Chair(s):</i> Vibhanshu Abhishek | |

- 060-0386** Mobile Trajectory-based Advertising: Evidence from a Large-scale Randomized Field Experiment
Anindya Ghose, Professor, New York University, United States
Beibei Li, Assistant Professor, Carnegie Mellon University, United States
Siyuan Liu, Professor, Carnegie Mellon University, United States

We propose a new mobile advertising strategy based on consumers' offline moving trajectories. To evaluate the advertising effects, we design a randomized field experiment in a large shopping mall. We found our approach is most effective compared to other existing location-based advertising approaches, especially for the high income consumers.

- 060-1611** Effect of Piracy on Adoption of Technological Innovation
Vibhanshu Abhishek, Assistant Professor, Carnegie Mellon University, United States
Rahul Telang, Professor, Carnegie Mellon University, United States
Yi Zhu, Student, Carnegie Mellon University, United States

In this paper, we explore the interplay of piracy and technology adoption based on a dynamic model. When the cost for innovation adoption is small, the piracy has no effect on the timing of technology adoption. However, when this cost is sufficiently high, piracy acts as a competing force.

- 060-0753** IT Investment under Competition: The Role of Implementation Uncertainty
Vidyanand Choudhary, Associate Professor, University of California Irvine, United States
Mingdi Xin, Assistant Professor, University of California Irvine, United States

This paper examines firms' IT investment decisions in a competitive environment. In a game theoretic model, we show that an important feature of IT investment challenges standard theories' predictions: the outcome of an IT implementation can be highly uncertain. We study firms' IT investment and profitability with or without uncertainty.

- 060-0718** Exploring the Relationship between Information Sharing and Technology Management for Cybersecurity
Senay Solak, Assistant Professor, University of Massachusetts Amherst, United States
Yueran Zhuo, Student, University of Massachusetts Amherst, United States

We study the relationship between cybersecurity technology management decisions of a firm and security related information exchanges with other firms. We use stochastic modeling and industry data to reach conclusions on the optimal levels of cybersecurity information to share as part of a firm's investment portfolio for cybersecurity technologies.

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| 127 | Friday, 05:00 PM - 06:30 PM, Du Pont | Track: Global Operational Issues |
| | Session: The Economics of Human Capital: A Global Perspective | |
| | Chair(s): Nishtha Langer | |

- 060-1600** How High-skill Foreign-born IT Professionals Assimilate in the United States
Sunil Mithas, Professor, University of Maryland, United States
Kunsoo Han, Associate Professor, McGill University, Canada
Henry Lucas, Professor, University of Maryland, United States

This paper examines the economic assimilation of high-skill foreign information technology (IT) professionals in the United States by examining their wage trajectories. We use data on skills and compensation of more than 57,000 IT professionals in the U.S. over the 2000-2006 period to test our hypotheses.

- 060-1654** Impact of R&D Investment and Workforce Education on the Performance of Information Technology Firms
Sunil Wattal, Associate Professor, Temple University, United States

Investment in R&D and workforce are important for information technology (IT) firms. Results from analyzing 713 firm-year observations over 2000-2006 from 216 firms in Taiwan indicate that both R&D and education have a positive impact on a firm's ROA and the interaction effect between R&D and education is positive.

- 060-0827** Sorting by Fringe Benefits: Evidence from Online Reviews
Xuan Ye, Student, Stern School of Business, United States
Prasanna Tambe, Associate Professor, New York University, United States

By mining over 1 million reviews posted by employees, we construct firm level measures about fringe benefits including wellness, perks, financial, family and vacation etc. We find evidence suggesting that firms offer different compensation packages in order to sort workers they would like hire.

- 060-1542** Achieving Project Management Goals in Ghana: The Role of Social Capital
Kwasi Amoako-Gyampah, Professor, University of North Carolina Greensboro, United States
Ebenezer Adaku, Lecturer, Ghana Institute of Management and Public Administration, Ghana
Moses Acquah, Professor, University of North Carolina Greensboro, United States
Samuel Famiyeh, Senior Lecturer, Ghana Institute of Management and Public, Ghana

Underdeveloped countries are plagued by uncompleted and abandoned projects. Some projects exceed their budgets, and some never achieve their performance objectives. Given that social capital provides access to resources to individuals, and organizations, this study examines how social capital contributes to project management performance and goals within organizations in Ghana.

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| 128 | Friday, 05:00 PM - 06:30 PM, Embassy | Track: Service Operations |
| | Session: Managing Interactions with Customers and Customized Services | |
| | Chair(s): Joel Goldhar | |

- 060-0582** Quantifying Service Interactions: A Formal Approach for Modeling Producer/Customer-interfaces
Rainer Souren, Professor, Department for Sustainable Production and Logistics Management, Germany
Magnus Richter, Assistant Professor, Department for Sustainable Production and Logistics Management, Germany

Service production has been explored extensively but a formal framework for modeling service interactions is still missing. The paper presents an axiomatic framework for quantifying service interactions based on Activity Analysis. Doing so core characteristics of services interactions (external factor, types of customer participation, length of interaction) can be captured.

- 060-1236** Customer Role in Public Service Operations
Isabell Storsjö, Student, Hanken School of Economics, Finland

Pressure to serve 'citizen-customers' better and more cost-efficiently has urged the public to adopt commercial sector operations management practices. However, multiple goals of public services and conflicting stakeholder requirements complicate the task of fulfilling customer needs and expectations. This paper intends to clarify the customer role in public service operations.

- 060-0469** Using Sociotechnical Systems Theory and Models to Design More Effective Service Operations
Joel Goldhar, Professor, Illinois Institute of Technology, United States
Thomas Kull, Associate Professor, Arizona State University Tempe, United States
Arjun Chakravarti, Assistant Professor, Illinois Institute of Technology, United States
Matt Lauritsen, Student, Illinois Institute of Technology, United States

A true 'Service' implies human interactions for simultaneous production and consumption. We show how the STS Model can be used to design effective Services: where the Customer is a highly integrated member of the STS; able to affect employee satisfactions, business profitability and the quality of service to other customers.

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- 060-1641** An Examination of the Companion's Role-play on the Target Customer's Perceptions of Service Quality
Jiyoung Kim, Lecturer, Yonsei University, Korea, Republic of (South Korea)
Jing Jin Li, Student, Yonsei University, Korea, Republic of (South Korea)
Sunmee Choi, Professor, Yonsei University, Korea, Republic of (South Korea)

In this study, we empirically examine that the quality of role-play of the companion influences the target customer's quality perceptions of service received from service providers and that this influence is moderated by the relationship quality and the stress level, in the context of healthcare services.

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| 129 | Friday, 05:00 PM - 06:30 PM, Fairchild East | <i>Track:</i> Healthcare Operations Management |
| | <i>Session:</i> Innovations in the Healthcare Supply Chain | |
| | <i>Chair(s):</i> Mili Mehrotra | |

- 060-0746** When is an Ounce Of Prevention Worth A Pound Of Cure? Identifying High-risk Candidates for Case Management
Margret Bjarnadottir, Assistant Professor, University of Maryland, United States
David Anderson, Assistant Professor, City University of New York, United States

Studies on the cost-effectiveness of case management programs find that their performance is mixed, at best. We posit an opportunity for improvement by targeting certain patients for case management and early intervention. Utilizing modern data mining methods, we develop a patient selection methodology, and analyze its effects.

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- 060-0874** Enabling Health Care Delivery with High-tech Innovation: A Longitudinal Field Study of Robot-assisted Surgery
Ujjal Mukherjee, Student, University of Minnesota, United States
Kingshuk Sinha, Professor, University of Minnesota, United States

We report a field study on robotic surgical procedures in a large hospital. We investigate the impact of technology mediation on outcome variation given input heterogeneity like doctors' experience, and team diversity. Also, we investigate the nature of doctors' and teams' learning on the robot that lead to higher usage.

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- 060-1073** Bundled Payments for Care Improvement: Post-acute Care Provider Decisions
Brenda Courtad, Student, University of Cincinnati, United States
Michael Magazine, Professor, University of Cincinnati, United States

Several decisions must be made for a provider to enter into CMS's Bundled Payments for Care Improvement Initiative. We present a model to support these decisions for a post-acute care provider.

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| 130 | Friday, 05:00 PM - 06:30 PM, Fairchild West | <i>Track:</i> Healthcare Operations Management |
| | <i>Session:</i> Improving patient outcome and satisfaction | |
| | <i>Chair(s):</i> Yuqian Xu | |

- 060-0428** Multi-year Multivariate Modeling of Service Quality and Patient Satisfaction
Dana Johnson, Professor, Michigan Technological University, United States
Roberta Russell, Professor, Virginia Polytechnic Institute And State University, United States
Sheneeta White, Assistant Professor, University of St. Thomas, St. Paul, MN, United States

An extension of prior research addresses the need to understand patient perceptions of service quality and its impact on patient satisfaction in a rural healthcare organization. Results indicate that there are significant differences over the three-year time period. Patient centered outcomes research focused on the qualitative attributes impacting satisfaction.

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- 060-1135** The Limits of Standardization: Linking length of Stay to Patient Outcomes Policies
Rodolfo Catena, Student, University of Oxford, United Kingdom
Sue Dopson, Professor, University of Oxford, United Kingdom
Matthias Holweg, Professor, University of Oxford, United Kingdom
Mark Woodward, Professor, University of Oxford, United Kingdom

In this study we respond to the call by KC and Terwiesch (2009) to investigate the impact of case-mix "severity" on early discharge. Using hospital admission data from 1999 to 2011 for NHS England, we analyze the effects of length of stay policies on patient outcomes.

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- 060-1374** Customers Online Evaluation of Outpatient Care: An Operational Viewpoint
Yuqian Xu, Student, New York University, United States
Mor Armony, Associate Professor, New York University, United States

In this paper, we study two data sets of leading online doctor appointment booking and review webpages. We analyze the impact of operational factors on patient's valuations. Based on the empirical results, we propose a queuing model considering physician's service decisions.

060-1668 Profiling Conundrum in Biopsy Decisions Based on Mammography: When Does Patient Profile Information Benefit?

Mehmet Ayvaci, Assistant Professor, University of Texas Dallas, United States

Mehmet Ahsen, Student, University of Texas Dallas, United States

Srinivasan Raghunathan, Professor, University of Texas Dallas, United States

Zahra Gharibi, Student, Southern Methodist University, United States

We study the use of clinical risk information when interpreting mammograms in the context of breast cancer diagnosis. We also examine the operational design and decision-making relationship under profiling bias. We find that an unbiased use of profile information with an appropriate weight could improve the decision quality.

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Friday, 05:00 PM - 06:30 PM, Gunston West

Track: Marketing and OM Interface

Session: Innovative Strategies in Product Delivery and Services

Chair(s): Tingliang Huang

060-0045 Licensing Contracts in Conspicuous Markets

Kenan Arifoglu, Assistant Professor, University College London, United Kingdom

Prateek Raj, Student, Management Science and Innovation, United Kingdom

We study licensing decision of a brand-owning firm that sells its primary product to conspicuous customers, who value the brand exclusivity, and also licenses its brand name to a licensing firm. We compare fixed-fee and royalty contracts, and develop a mixed contract that improves the profit and coordinates the system.

060-0529 The Operational Advantage of Threshold Discounting Offers

Simone Marinesi, Assistant Professor, Wharton, United States

Karan Girotra, Assistant Professor, INSEAD, France

Serguei Netessine, Professor, INSEAD, Singapore

Inspired by Groupon, this study examines how Threshold-Discounting strategies– the idea to offer discounted deals to customers conditional on enough customers subscribing to the offer– can significantly boost operational performance and profit by improving capacity utilization. We show that, in this context, customer strategic behavior is beneficial to the firm.

060-0494 Money-back Guarantees When Physical and On-line Retailers Compete

Hang Ren, Student, University College London, United Kingdom

Tingliang Huang, Assistant Professor, Rensselaer Polytechnic Institute, United States

Christopher Tang, Professor, University of California Los Angeles, United States

Ying-Ju Chen, Associate Professor, Hong Kong University of Science & Tech, Hong Kong

We study the pricing and product return policies when physical and on-line stores compete. We find that the on-line store offers money-back guarantees when its salvage advantage outweighs total return hassle. Interestingly, better service quality may hurt the on-line store.

060-0730 Optimal Learning and Development Strategy for Entrepreneurial Product Launch

Onesun Yoo, Assistant Professor, University College London, United Kingdom

Tingliang Huang, Assistant Professor, University College London, United Kingdom

Kenan Arifoglu, Assistant Professor, University College London, United Kingdom

We examine the setting of an entrepreneurial firm engaged in early product development process. We adopt a Bayesian approach and present a formal model of learning and development in the entrepreneurial firm's product development process. We examine whether or not and when such frequent developing and learning cycles are beneficial.

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Friday, 05:00 PM - 06:30 PM, Coats

Track: Retail Operations Management

Session: Pricing in retail operations

Chair(s): Joline Uichanco

060-1383 Tractable Approximations to Joint Assortment and Price Revenue Function, under General Choice Models

Srikanth Jagabathula, Assistant Professor, New York University, United States

Paat Rusmevichientong, Associate Professor, University of Southern California, United States

We propose a tractable model class that can locally approximate a general revenue function that specifies expected revenues jointly as a function of the offer set and the price vector. We propose techniques to efficiently estimate the model parameters from aggregated purchase transactions. The model is empirically validated with data.

060-0178 Data-driven Learning in Dynamic Pricing Using Adaptive Optimization

Phebe Vayanos, Student, Sloan School of Management, United States

Dimitris Bertsimas, Professor, Massachusetts Institute of Technology, United States

We consider the pricing problem faced by a retailer endowed with a finite inventory of a product with unknown demand curve offered to price-sensitive customers. We formulate the seller's problem as an adaptive optimization problem with decision-dependent uncertainty set and propose a tractable solution approach.

060-1194 Price Matching in Omni-channel Retail: To Match or Not to Match?

Markus Ettl, Manager, IBM, United States

Pavithra Harsha, Research Staff Member, IBM, United States

Shiva Subramanian, Research Staff Member, IBM, United States

Joline Uichanco, Assistant Professor, University of Michigan Ann Arbor, United States

Price-matching is a strategy to attract shoppers in an increasingly competitive omni-channel environment. We propose a data-driven method for price-matching by computing a retailer's value-at-risk against its omni-channel competitors. The retailer can price-match competitors for which it has a high value-at-risk. We demonstrate our method using a large retailer's dataset.

134

Friday, 05:00 PM - 06:30 PM, Monroe

Track: Meetings & Symposiums*Session:* Doctoral Consortium 3*Chair(s):* Rachna Shah**060-1702** Doctoral Consortium 3

Rachna Shah, Associate Professor, University of Minnesota, 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.

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Friday, 05:00 PM - 06:30 PM, Holmead East

Track: Service Operations*Session:* Service Operations*Chair(s):* Masha Shunko**060-0446** Managing Customer Expectations and Priorities with Delay Announcements

Qiuping Yu, Assistant Professor, Indiana University, United States

Gad Allon, Professor, Northwestern University, United States

Achal Bassamboo, Associate Professor, Northwestern University, United States

Seyed Iravani, Professor, Northwestern University, United States

We study in a service environment, how to manage customers' expectations and to prioritize customers appropriately to maximize the firm's profits. Specifically, we focus on a setting where the firm uses only delay announcements and study the opportunities and limitations of this mechanism in the presence of heterogenous customers.

060-0451 Service Outsourcing with Strategic Collaboration of Competing Servers

Ying Xu, Student, Carnegie Mellon University, United States

Alan Scheller-Wolf, Professor, Carnegie Mellon University, United States

A client outsources service tasks to two servers, but the two servers would strategically collaborate by transferring jobs internally. Such collaboration increases capacity utilization but dampens capacity competition, so its impact on system performance is unclear. By analyzing the collaboration equilibrium we explore how strategic collaboration affects dual-outsourcing contract design.

060-1105 Designing, Scheduling, and Pricing Differentiated Services under Quality-speed Tradeoffs

Sherwin Doroudi, Student, Tepper School of Business, United States

Philipp Afeche, Associate Professor, Rotman School of Management, Canada

Mustafa Akan, Associate Professor, Tepper School of Business, United States

Mor Harchol-Balter, Professor, School of Computer Science, United States

Quality-speed tradeoffs are present in many service settings: longer processing increases quality, but also increases delays. We consider a queueing model with utility-maximizing, time-sensitive customers whose service valuations are increasing in processing time. We study the problem of optimally designing, scheduling, and pricing differentiated services, both under welfare- and revenue-maximization.

060-1480 The Persistence of Customer Incompatibility: Evidence from a Retail Bank Acquisition

Ryan Buell, Professor, Harvard University, United States

Dennis Campbell, Associate Professor, Harvard University, United States

When a firm acquires a customer whose needs and preferences are misaligned with its operating system, will the customer's preferences conform over time? Will the customer defect? Or, will the misalignment persist? We leverage a natural experiment created when one nationwide retail bank acquired another to answer these questions.

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Friday, 05:00 PM - 06:30 PM, Holmead West

Track: Service Operations*Session:* Capacity Investments in Services*Chair(s):* Guowei Dou**060-0013** One-side Value-added Service Investment and Pricing Strategy for a Two-sided Platform

Guowei Dou, Student, school of management, China

We investigate one-side value-added service investment strategy from two-sided platform perspective. With marginal cost increment beyond a threshold, both the investment and the price for invested side decrease. Compared with no investment, the uninvested side may either be priced higher or lower and the price increment could be larger.

- 060-1160** Strategic Competence Management in Global Service Networks: An Integrated Approach
Axel Faix, Student, Institute for Technology Management - Chair of Production Management, Switzerland
Thomas Friedli, Associate Professor, Institute for Technology Management - Chair of Production Management, Switzerland
Lukas Budde, Student, Institute for Technology Management - Chair of Production Management, Switzerland

The paper is based on industry projects in the pharmaceutical industry and describes a holistic approach to integrate competence management, capacity planning and strategic forecasting in the field of service operations in a global service network. Goal of the paper is to introduce a methodology combining operations and strategic management.

- 060-1586** Enhancing Competitiveness through Management of Capacity Losses
Vivekanand Khanapuri, Associate Professor, National Institute of Industrial Engineering, Mumbai, India
Milind Akarte, Associate Professor, National Institute of Industrial Engineering, Mumbai, India
Som Bhattacharyya, Associate Professor, National Institute of Industrial Engineering, Mumbai, India

Costly and complex mining equipment working in extreme environment warrant effective and competitive maintenance services. Capacities & capabilities are normally built considering peak demands leading to under-utilization. Moreover, capacity losses occur due to poor process management, layout, and improper manpower deployment. Managing losses with innovative service models can enhance competitiveness.

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| 137 | Friday, 05:00 PM - 06:30 PM, Kalorama | <i>Track:</i> Closed Loop Supply Chains |
| | <i>Session:</i> Circular Flows in Closed-Loop Supply Chains: Environmental Considerations and Servicizing | |
| | <i>Chair(s):</i> Aybek Korugan | |

- 060-1404** A Theoretical Model in Higher Education: A Finite Closed Loop Supply Chain
Julio Zavala, Student, National University of Honduras, Honduras
Cesar Ortega, Student, Universidad Nacional Autónoma de Honduras, Honduras
Jose Arrazola, Student, National University of Honduras, Honduras

A closed loop in the higher education supply chain consists in the reuse of its results, over and over. This is a circular process that allows to “furbish” (i.e. increase aggregated value of) its input. This recycling behavior makes up a finite closed supply chain.

- 060-1043** Closed-loop Supply Chain: Green Practices in the Home Appliance Industry
Mayara Barbosa, Student, Centro Universitario Da Fei, Brazil
Gabriela Scur, Professor, Centro Universitario Da Fei, Brazil

This paper aims to analyze which green practices are being used for focal firms in the Brazilian home appliances sector. The research results demonstrate that the waste management practice is the most used one. On the other hand, green buy and life cycle analysis practices are less widespread.

- 060-1360** Closing the Loop with Servicizing
Aybek Korugan, Associate Professor, Bogazici University, Turkey
Hande Yaman, Student, Bogazici University, Turkey
Oznur Ozdemir, Assistant Professor, Akdeniz University, Turkey

A truly closed loop supply chain (CLSC) requires certainty in return flows. Servicizing provides such a certainty as the ownership is retained by the OEM. In a CLSC with servicizing, repetitive leasing of products require a balance between design investment and price. In this study we investigate this balance.

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| 138 | Friday, 05:00 PM - 06:30 PM, Jay | <i>Track:</i> Product Innovation and Technology Management |
| | <i>Session:</i> Managing Innovation in Supply Chains | |
| | <i>Chair(s):</i> Sriram Narayanan | |

- 060-1385** An Empirical Study of Inter-firm Work Design on Technology Exploration and Exploitation and Firm Outcome
Xiaojin Liu, Student, University of Minnesota, United States
Susan Goldstein, Associate Professor, University of Minnesota, United States
Kingshuk Sinha, Professor, University of Minnesota, United States

The important role of adopting various inter-firm work design arrangements in global supply chains is highlighted in recent literature. Yet, little is known about how inter-firm work design relates to specific technology exploration and exploitation activities. We investigate the interrelationships among work designs, technology development and firm operating performance.

- 060-0619** Revealing the Consequences of Asymmetric Buyer-supplier Relationships on Opportunism and Performance
Veronica Villena, Assistant Professor, Penn State University University Park, United States
Christopher Craighead, Associate Professor, Penn State University University Park, United States

While informative, the buyer-supplier relationship research stream has often relied on a single side of the relationship and thus has tended to overlook situations where asymmetries between buyer and supplier exist. We examine two types of asymmetries, size and relational capital, and their impact on performance and opportunism.

- 060-0745** Relationship between Supply Networks and Innovation Performance
Marcus Bellamy, Student, Georgia Institute of Technology, United States
Soumen Ghosh, Professor, Georgia Institute of Technology, United States
Manpreet Hora, Assistant Professor, Georgia Institute of Technology, United States

We investigate the relationship between supply network structural characteristics and firm innovation. Using secondary data on 390 firms, we find direct benefits from supply network accessibility and an interacting benefit with interconnectedness on firm innovation output, as well as positive moderating effects from absorptive capacity and supply network.

- 060-0267** Supply Network Architecture and OEM Performance: A Contingency Perspective
Sriram Narayanan, Associate Professor, Michigan State University, United States
Myung Kyo (M.K.) Kim, Assistant Professor, Kansas State University, United States
Ram Narasimhan, Professor, Michigan State University, United States

This study examines the impact of key supply chain network indicators to examine the impact of supply network architecture on performance outcomes. Specifically, we examine the contingent effects of OEM influence in its immediate suppliers' on OEM outcomes.

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Friday, 05:00 PM - 06:30 PM, Morgan
Session: Supply Chain Network Design II
Chair(s): Aditya Pandit

Track: Supply Chain Management

- 060-0320** Supply Chain Strategy: Further Developments on How to Match Product Type with Supply Chain Design
Mojtaba Mahdavi, Student, University of Auckland, New Zealand
Tava Olsen, Professor, University of Auckland, New Zealand

This presentation discusses how to best match supply chain design to product type. Extensions to Fisher's (1997) canonical framework, which matches functional or innovative products with efficient or responsive supply chains, are reviewed. A quantitative model is presented that is based on market need and demand volatility.

- 060-0658** A Strategic Approach for Making End of Life Choices for Ships
Aditya Pandit, Student, Northeastern University, United States

This presents an approach for selecting End-Of-Life strategies for large merchant vessels through a comprehensive review of all research in the fields of recycling, reuse and remanufacturing in the area of interest.

- 060-0660** A Fuzzy Approach for a Supply Chain Network Design Problem
Can Celikbilek, Student, Ohio University, United States
Bulent Erenay, Student, Ohio University, United States
Gursel Suer, Professor, Ohio University, United States

This study considers different fuzzy fitness parameters while determining the locations of distribution centers. Different potential risk factors are taken into consideration. The ultimate objective is maximizing the total profit while minimizing the risks encountered in supply chain designs.

- 060-0671** Designing Urban Delivery Territories for a Beer Company
Sergio Caballero, Student, Tecnologico De Monterrey, Mexico
Edgar Blanco, Professor, Massachusetts Institute of Technology, United States
Karla Valenzuela, Professor, Tecnologico De Monterrey, Mexico

One of the most relevant problems companies face is how to segment customers into compact-balanced territories for efficient distribution in congested urban areas. We propose a tree-based time-dependent clustering algorithm that uses a variable-speed road-network. It was applied to a beer company in Mexico-City, yielding better solutions than traditional approaches.

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Friday, 05:00 PM - 06:30 PM, Northwest
Session: Product and Process Development in Pharmaceutical Industry
Chair(s): Zhili Tian

Track: Product Innovation and Technology Management

- 060-0885** Research Productivity in a Simulated Pharmaceutical Supply Network
Christian Rossetti, Assistant Professor, North Carolina State University, United States
Robert Handfield, Professor, North Carolina State University, United States
Thomas Choi, Professor, Arizona State University Tempe, United States

Network approaches to studying supply chains have gained importance over the past decade. Previous research has shown that network variables effect innovation as well as profitability. Using the results of a multi-agent simulation of the pharmaceutical supply chain we measure the effects of network parameters on research productivity.

- 060-0943** Data Uncertainty in Markov Chains: Application to Cost-effectiveness Analyses of Medical Innovations
Joel Goh, Assistant Professor, Harvard University, United States
Mohsen Bayati, Assistant Professor, Graduate School of Business, United States
Stefanos Zenios, Professor, Stanford University, United States

A common problem with using Markov chains in medical cost-effectiveness studies is that estimates of the transition matrix of the chain may be imprecise. We present an optimization-based approach for assessing the effect of this imprecision and demonstrate its application to colorectal cancer detection.

- 060-1376** Manufacturing Network Configuration, Network Coordination, and Performance
Zhexiong Tao, Student, McGill University, Canada

Shanling Li, Professor, McGill University, Canada

Saibal Ray, Professor, McGill University, Canada

A firm's manufacturing network plays an important role in achieving competitive advantage. Using a structure-infrastructure-performance framework, we explore the impact of manufacturing network configuration and network coordination on product and process performances. All the hypotheses are developed and tested.

060-0407 Optimal Investment in Late Stage New Drug Development

Zhili Tian, Assistant Professor, Florida International University, United States

Firms conduct Phase III drug trials by enrolling and treating hundreds or thousands of patients. Finding these patients is expensive and time consuming, with uncertainty. We consider how firms should determine their investment policy. This must be done recognizing that there is also uncertainty in the outcome of a trial.

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Friday, 05:00 PM - 06:30 PM, Oak Lawn

Track: Risk Management in Operations

Session: Supply Chain Financing

Chair(s): Nikolaos Trichakis

060-0578 The Financial Holding Cost of Inventory

Xiaoying Liang, Lecturer, City University of Hong Kong, Hong Kong

Fehmi Tanrisever, Assistant Professor, Bilkent University, Turkey

Lei Xie, Associate Professor, Shanghai University of Finance and Economics, China

S. Alex Yang, Assistant Professor, London Business School, United Kingdom

We study a joint financing and inventory management model that characterizes firms' inventory and cash holding policies under certain financial market imperfections. The result is related to the traditional inventory models to shed lights on the financial holding cost of inventory.

060-1261 Operationalizing Financial Covenants

Dan Iancu, Assistant Professor, Stanford University, United States

Nikolaos Trichakis, Assistant Professor, Harvard University, United States

Gerry Tsoukalas, Assistant Professor, University of Pennsylvania, United States

We study the optimal design of financial covenants for lending contracts between a bank and an inventory manager. We elicit the dependence of the optimal covenant term on important operational parameters, e.g., operating margin, demand, inventory depreciation rate and operational flexibility.

060-1479 Supply Chain Disruptions and the Role of Information Asymmetry

William Schmidt, Assistant Professor, Cornell University, United States

Ananth Raman, Professor, Harvard University, United States

Disruptions damage firm value. This may induce (1) managers to behave strategically in revealing operational disruptions and (2) the market to respond differently to disruptions when managers can behave strategically. Both factors distort the true economic impact of disruptions on firm value. Our research sheds light on these tangled relationships.

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Friday, 05:00 PM - 06:30 PM, Parlor A

Track: General Track

Session: Interdisciplinary Research in Operations

Chair(s): Cristina Sancha

060-0648 Interdisciplinary Research of Operations Management and other Business Fields: A Citation Analysis

Chaojiang Wu, Assistant Professor, Drexel University, United States

Erjia Yan, Assistant Professor, Drexel University, United States

Chelsey Hill-Esler, Student, Drexel University, United States

we study the knowledge dissemination of OM and other business disciplines such as marketing, finance, MIS, management, and accounting. Using a comprehensive dataset from Elsevier, we explore the citation patterns of OM journals and the information exchange with other business disciplines. We also investigate factors that affect interdisciplinary knowledge dissemination.

060-0572 Does the Use of Temporary Workers Hurt the Efficacy of Operational Practices?

Cristina Sancha, Student, Esade Business School, Spain

Frank Wiengarten, Assistant Professor, Esade Business School, Spain

Firms are increasingly using precarious workers (e.g. temporary workers) in their operation. However, the performance impact of such is not explored extensively. Our objective is to study the usage of precarious work and its impact on the efficacy of operational practices.

060-1112 E-learning Service in Brazilian Public Organizations

Fernando Pereira, Student, University of Sao Paulo, Brazil

Maria Gouvea, Associate Professor, University of Sao Paulo, Brazil

This study investigated the constructs that influence satisfaction and continuous use intention in e-learning services through a sample of 343 employees of two Brazilian public organizations. The main contribution of this study is the delivery of an assessment tool for performance oriented to training courses at distance in public organizations.

Friday, 05:00 PM - 06:30 PM

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Friday, 05:00 PM - 06:30 PM, Columbia 5-8

Track: Meetings & Symposiums

Session: Semi-Plenary on Relevance, College of Humanitarian and Crisis Management: Preventing, Preparing for, and Responding to Disasters

Chair(s): Jarrod Goentzel

060-1721 Preventing, Preparing for, and Responding to Disasters

Trevor Rikken, VP, American Red Cross, United States

Trevor Rikken, Vice President, Disaster Operations & Logistics at the American Red Cross, will share insights from a comprehensive organizational assessment of all ARC preparedness, response, and recovery programs, which resulted in revamped processes to improve service delivery in disasters small and large. There will be time for Q&A.

Sessions for Saturday, May 09

Saturday, 08:00 AM - 09:30 AM

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Saturday, 08:00 AM - 09:30 AM, Columbia 1

Track: Behavior in Operations Management

Session: Human Judgment in Operational Contexts

Chair(s): Enno Siemsen

060-1228 Evaluating Judgment Bias in Detecting Failures of Hightech Innovations-in-Use: Analysis of Big Data on Market

Ujjal Mukherjee, Student, University of Minnesota, United States

Kingshuk Sinha, Professor, University of Minnesota, United States

We use predictive analytics on a big dataset related to medical devices to show that substantial judgment bias (under-reaction or over-reaction) exists among firms in detecting failures of devices while-in-use from user generated market feedback. We also investigate several firm and product related sources of under-reaction or over-reaction to user-feedback.

060-1300 An Experimental Investigation on the Impact of Feedback on Quality Management

Kyle Goldschmidt, Assistant Professor, University of St. Thomas, United States

Janine Sanders, Assistant Professor, University of St. Thomas, United States

Sheneeta White, Assistant Professor, University of St. Thomas, United States

Customer feedback can play a crucial role in the success or failure of a product. This study investigates how customer feedback influences if and when quality managers invest in quality improvements.

060-1350 Fairness in Inventory Rationing

Tamás Csermely, Student, Vienna Univ of Econ & Business Admin, Austria

Stefan Minner, Professor, Technische Universität München, Germany

We conducted an experiment to explore fairness in inventory rationing in a multi-period setting with 1 warehouse (rationing decisions) and 2 retailers (newsvendor decisions). We test for the presence of turn-and-earn strategies, the effect of period-specific/cumulative profits, ex ante/ex post, distributive/peer-induced fairness concerns; retailers' size, incumbency and switching opportunity.

060-1417 Task Decomposition and Newsvendor Decision Making

Yun Shin Lee, Assistant Professor, KAIST, Korea, Republic of (South Korea)

Enno Siemsen, Associate Professor, University of Minnesota, United States

We separate newsvendor order decisions into point forecasts, uncertainty judgments, and service level decisions in a behavioral laboratory experiment. Decomposing orders in such a way can lead to performance improvements compared to ordering directly. Further, this approach enables a closer examination of the components of such decisions.

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Saturday, 08:00 AM - 09:30 AM, Columbia 2

Track: Closed Loop Supply Chains

Session: Legislative Issues in Closed-Loop Supply Chains

Chair(s): Isil Alev

060-0474 The Implications of Extended Warranties on a Closed-loop Supply Chain

Wayne Fu, Student, Georgia Institute of Technology, United States

Atalay Atasü, Associate Professor, Georgia Institute of Technology, United States

We established a stylized model that accounts for the effects of warranties, endogenizes the allocation strategies of manufacturers, and demonstrates the impact of extended warranties on product pricing, product-line choices, and profitability. We also highlight the relationship between extended warranties and product-line choices in a closed-loop supply chain.

060-1109 Recycled Content Claims: Impact of Environmentally Preferable Purchasing (EPP) under Supply Uncertainty

Aditya Vedantam, Student, Purdue University, United States

Ananth Iyer, Professor, Purdue University, United States

Paul Lacourbe, Associate Professor, Ceu Business School, Hungary

Manufacturer's making recycled content claims see demand from the federal government's EPP programs. However, supply issues like uncertainty in municipal collection, constrain the amount of recycled content available to the manufacturer. We study how EPP programs and supply issues interact to affect the level and type of a manufacturer's claim.

060-1386 Joint Determination of Optimal Price and End-of-Life Option for a Product

Daniel Steeneck, Lecturer, Massachusetts Institute of Technology, United States

Subhash Sarin, Professor, Virginia Polytechnic Institute And State University, United States

The characteristics of a product and its parts determine the optimal End-of-Life (EOL) option for the product. One key characteristic of a product is its demand. However, product pricing affects demand, and thus, EOL option. We present methods of jointly determining optimal price and EOL option for a product.

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Saturday, 08:00 AM - 09:30 AM, Columbia 3
Session: Industry Studies & Public Policy – I
Chair(s): Nitin Joglekar

Track: Empirical Research in Operations Management

- 060-0115** Service Excellence in US Hotels: A Longitudinal Analysis
Eve Rosenzweig, Associate Professor, Emory University, United States
Carrie Queenan, Assistant Professor, University of South Carolina, United States
Ken Kelley, Associate Professor, University of Notre Dame, United States

We examine the origins and consequences of service excellence in the highly competitive US hotel industry using a cross-functional literature base and path analysis. Our empirical results are based on five years of archival data from 478 properties of a leading hotelier competing at the higher end of the market.

- 060-0294** Unearthing the Productivity, Quality Paradox: Evidence from the Automobile Industry
Bilal Gokpinar, Assistant Professor, University College London, United Kingdom
Sriram Narayanan, Associate Professor, Michigan State University, United States

We examine the impact of managing engineering changes and plant utilization on both final product quality and plant productivity in the automobile industry using a proprietary dataset. Combining and analyzing data on engineering changes, plant operations, and subsequent warranty claims, we reconcile the opposing influence of increasing utilization on productivity.

- 060-1408** Management Challenges in Professional Services: Insights from Hospitality Consulting Industry
Matthew Walsman, Student, Cornell University, United States
Alistair Brandon-Jones, Professor, University of Bath, United Kingdom
Michael Lewis, Professor, University of Bath, United Kingdom
Rohit Verma, Professor, Cornell University, United States

This paper takes a deep dive approach into the managerial characteristics and challenges evident in consultancy firms today. Using mixed methods (best-worst survey-based study supported by qualitative interviews of consultants) we find that many traditional frameworks misrepresent the way consultants manage their businesses today.

- 060-0257** The Role of Industry Studies and Public Policies in Production and Operations Management
Nitin Joglekar, Associate Professor, Boston University, United States
Jane Davies, Assistant Professor, University of Cambridge, United Kingdom
Edward Anderson, Associate Professor, University of Texas Austin, United States

We review a sample 178 papers published between 1992 and 2014. Analysis of content provides insights on themes and methodological issues that arise in cross-industry and intra-industry studies. It also illustrates a growing emphasis on research at the interface between public policies and operating decisions. Allied publication opportunities are discussed.

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Saturday, 08:00 AM - 09:30 AM, Columbia 4
Session: Waste in retail
Chair(s): Dorothee Honhon Xiajun Pan

Track: Retail Operations Management

- 060-0227** Measures for Reducing Chilled-food Waste at the Retail Outlet
Jack van der Vorst, Professor, Wageningen University, Netherlands
Seth Tromp, Assistant Professor, Wageningen University, Netherlands
Rene Haijema, Assistant Professor, Operations Research and Logistics Group, Netherlands
Hajo Rijgersberg, Assistant Professor, Food and Biobased Research, Netherlands

Food waste reduction has major attention in practice and academia. We derive a variety of technological, commercial and logistics measures that may reduce waste of perishable products in retail outlets. A discrete-event simulation model is used to assess the impact of each measure on food quality, stock-outs and food waste.

- 060-0261** Optimal Ordering Policy and Display for Perishable Products
Xiajun Pan, Assistant Professor, University of Florida, United States
Dorothee Honhon, Assistant Professor, University of Texas Dallas, United States
Zumbul Atan, Assistant Professor, Eindhoven University of Technology, Netherlands

We consider the problem of a retailer managing fresh and non-fresh products. Retailers may display the fresh and non-fresh products differently. We characterize the optimal display setting and optimal ordering policy for the fresh products under different cases depending on the discount on the non-fresh products.

- 060-0465** Dynamic Programming to Reduce Environmental Impacts of Food Waste at Campus Dining Services
Esma Birisci, Student, Industrial and Manufacturing Systems Engineering, United States
Ronald McGarvey, Assistant Professor, Industrial and Manufacturing Systems Engineering, Truman School of Public Affairs, United States

This research incorporates environmental impacts of food wastage into a cost-minimizing stochastic inventory model of campus dining service operations. We use Life Cycle Analysis estimates to account for broader environmental costs of wasted food, focusing on how optimal food production and ordering decisions can reduce storage losses and overpreparation losses.

Saturday, 08:00 AM - 09:30 AM

- 060-1285** An Empirical Study of the Diffusion of Online Materials & Waste Exchanges
Charles Corbett, Professor, University of California Los Angeles, United States
Suvrat Dhanorkar, Student, University of Minnesota, United States

Recently, Online Materials & Waste Exchanges (OMWEs) have emerged across the U.S. and Europe as a means to facilitate exchanges of industrial surplus materials, by-products and waste. We investigate factors that promote (and inhibit) the diffusion of OMWEs.

150	Saturday, 08:00 AM - 09:30 AM, Columbia 9	Track: Scheduling and Logistics
	Session: Fleet Capacity and Constraints	
	Chair(s): Sadegh Mirshekarian	

- 060-0835** Green Fleet Investment under Market, Regulatory, and Technological Uncertainty
Xishu Li, Student, Department of Technology and Operations Management, Netherlands
Rob Zuidwijk, Professor, Erasmus University Rotterdam, Netherlands
Rene De Koster, Professor, Erasmus University Rotterdam, Netherlands
Rommert Dekker, Professor, Erasmus University Rotterdam, Netherlands

Our research explores a fleet capacity investment problem under market, regulatory, and technological uncertainty. We study how competition between firms affects investment strategies, and investigate the optimal investment policy. Here, we focus on a single vessel type with the intention to extend our results to also incorporate green vessels.

- 060-0018** Capacity Sharing Among Truck Owners: A Collaborative Approach
Sarada Sarmah, Associate Professor, Indian Institute of Technology Kharagpur, India
Arindam Debroy, Student, Indian Institute of Technology Kharagpur, India

Highly fragmented trucking industry in India, has resulted in increased competition among the individual truck owners, with capacity constraint being their major problem. Collaboration among the truck owners will lead to optimal utilization of capacity. A mixed integer programming model is developed to optimize the revenue earned through collaboration.

- 060-0155** A New Heuristic for VRPTW with Fleet Limitation
Sadegh Mirshekarianbabaki, Student, Industrial & Systems Engineering, United States
Can Celikbilek, Lecturer, Industrial & Systems Engineering, United States
Gursel Suer, Professor, Ohio University, United States

A new heuristic is proposed for vehicle routing problem with time windows based on fleet limitation where driving time and working time restrictions are imposed. Customers are clustered based on their working time windows and then feasible routes are established in order to minimize the total traveling distance.

151	Saturday, 08:00 AM - 09:30 AM, Columbia 10	Track: Sustainable Operations
	Session: Investments in sustainable technologies	
	Chair(s): Gilvan Souza	

- 060-0063** Capacity Investment in Renewable Energy Technology with Supply Intermittency
Shanshan Hu, Assistant Professor, Indiana University Bloomington, United States
Gilvan Souza, Associate Professor, Indiana University, United States
Mark Ferguson, Professor, University of South Carolina, United States
Wenbin Wang, Assistant Professor, Shanghai University, China

We study an organization's one-time capacity investment in a renewable technology with supply intermittency and net metering compensation. We obtain solutions that are simple to compute, and intuitive. We present two cases: a PV system for a bank branch, and a solar system for water heating in a hotel.

- 060-0078** Investing and Replacing Energy Storage for Energy Shifting
Shanshan GUO, Student, Indiana University Bloomington, United States
Shanshan Hu, Assistant Professor, Indiana University Bloomington, United States
Gilvan Souza, Associate Professor, Indiana University, United States

Batteries may be used for energy shifting: Storing electricity when the power supply is abundant and releasing electricity when the supply is tight. A battery's capacity and useful life depends on how it is operated. Based on energy shifting demands, this paper determines the optimal battery size and replacement time.

- 060-0131** Capacity Investment under Substitution, Material Reduction and Recycling R&D
Aditya Vedantam, Student, Purdue University, United States
Ananth Iyer, Professor, Purdue University, United States

Global concerns about availability of metals like dysprosium, used in clean energy technologies like direct-drive wind turbines, has spurred various US DOE R&D projects. We develop a model with sequential direct drive capacity addition that provides an option value to these projects under progress in R&D milestones.

- 060-0313** Competitive Industry's Response to Environmental Tax Incentives for Green Technology Adoption
Anton Ovchinnikov, Associate Professor, Queens University, Canada
Dmitry Krass, Professor, University of Toronto, Canada

We consider operational aspects of how an industry composed of heterogeneous firms responds to an environmental tax by choosing production quantities and emissions-reducing technologies. We show the existence and uniqueness of the "market-only equilibrium" and demonstrate its many interesting properties. We then discuss the technology-and-market equilibria under different structural assumptions.

152	Saturday, 08:00 AM - 09:30 AM, Columbia 11	Track: Sustainable Operations
	Session: Efficient Management of Waste	
	Chair(s): Gilberto Mourao	

- 060-0052** The Environmental International Law on Procurement Initiatives with the New Brazilian Act by Sustainable Logistics
Washington Luiz Soares, Student, UNISANTOS, Brazil

This paper has investigated the SPPI's public model and how environmental law is applied in modal shift management at national and international level. The idea of the public procurement sector to lead with the public responsibility to get reductions in CO2 emissions inside of port zone is examined.

- 060-1264** Case Study in the Logistics of Liquid Waste Transfer for Storage Tank with Environmental Impact Reduction
Gilberto Mourao, Student, Centro Paula Souza, Brazil
Julia Barreto, Student, Centro Paula Souza, Brazil
Hamilton Pozo, Retired, Centro Paula Souza, Brazil
Getulio Akabane, Retired, CEETEPS, Brazil
Vicente Sinkunas, Student, Centro Paula Souza, Brazil

This article identifies means of reducing the environmental impact with the transfer of liquid contaminants from sump tank to the storage tank. To achieve the objective, bibliographical, documentary research and a proposed solution in the Brazilian industrial were accomplished. Potential impacts to the environment and to worker were mitigated.

- 060-1546** An Efficient Approach to Fit a Meta-model for Air Pollution Using Design of Experiment and RSM
Golshan Madraki, Student, Industrial & Systems Engineering, United States
Can Celikbilek, Student, Industrial & Systems Engineering, United States
Bulent Erenay, Student, Industrial & Systems Engineering, United States

In this study, the crucial factors causing air pollution are assessed. Current methodology includes of 4 steps: fitting a regression meta-model, application of factorial design in DOE, application of random surface methodology and fitting the meta-model as a multi-objective math model to minimize the factors caused air pollution.

153	Saturday, 08:00 AM - 09:30 AM, Columbia 12	Track: Global Operational Issues
	Session: Innovation in Supply Chains	
	Chair(s): Jingqi Wang	

- 060-0711** How Does Knowledge Flow within Supply Chains?
Hsiao-Hui Lee, Assistant Professor, University of Hongkong, China
Po-Hsuan Hsu, Assistant Professor, University of Hongkong, China

In today's competitive environments, customers collaborate with their suppliers to improve product quality, whereas suppliers share their knowledge with their customers to win orders. This paper studies the driving force of supply-chain knowledge spillovers using the patent information and the operational impacts of such spillovers.

- 060-0755** Intellectual Property Licensing in a Production Outsourcing Environment
Jingqi Wang, Assistant Professor, The University of Hong Kong, Hong Kong
Xiaole Wu, Assistant Professor, Fudan University, China

We consider a three-way partnership in intellectual property (IP) licensing among the IP provider, a manufacturer, and a supplier. The manufacturer has better demand information than the IP provider. We analyze the optimal licensing contract menu for the IP provider and show that it is different from the traditional licensing.

- 060-0793** Inclusive Innovation: Broader Market Coverage for Innovative Products with Deliberate Supply Chain
Oleksiy Mnyshenko, Student, University of California San Diego, United States
Vish Krishnan, Professor, University of California San Diego, United States
Hyoduk Shin, Assistant Professor, University of California San Diego, United States

How can we achieve broader market coverage for innovative products, i.e., inclusive innovation? Grounded in industrial practice, we show that deliberately choosing the contract leader and the investor in a multi-tiered supply chain can have a significant impact on market coverage. We discuss leadership handovers along the product life cycle.

- 060-1491** Incentive Issues in Omni-channel Sale
Yong-Pin Zhou, Associate Professor, University of Washington, United States
Jingqi Wang, Assistant Professor, The University of Hong Kong, Hong Kong
Elnaz Jalilipour Alishah, Student, University of Washington, United States

We consider an omnichannel retailer with both online and offline channels. Consumers can start a purchase process in one channel and might complete it in another. We study how the omnichannel retailer should design an appropriate credit mechanism to incentive both channels and create coordination.

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Saturday, 08:00 AM - 09:30 AM, Piscataway

Track: Production Planning and Scheduling*Session:* Contemporary Scheduling Theory and Application*Chair(s):* Zhixin Liu

- 060-0848** Hybrid MTO-MTS Production Planning: Varying the MTS Batch Size
Bart Beemsterboer, Student, University of Groningen, Netherlands
Martin Land, Associate Professor, University of Groningen, Netherlands
Ruud Teunter, Professor, University of Groningen, Netherlands

We consider a hybrid make-to-order/make-to-stock production system with machine setups and explore the dependence of the optimal MTS batch size on the amount of MTO orders and the MTS inventory level. We show using a Markov Decision Process that cost savings can be obtained by varying the MTS batch size.

- 060-0390** Optimal, Socially Responsible, and Sustainable Supplier Selection Problem
Gang Li, Assistant Professor, Bentley University, United States
Yu Xia, Associate Professor, Northeastern University, United States

We model the supplier selection decisions that strive for a balance among Environmental, Social, and Governance (ESG) performance, sourcing cost, and delivery time. A frontier approach is adopted to incorporate the multi-criteria features of the problem and efficient algorithms are proposed.

- 060-1208** On the Shapley Value of Single Machine Sequencing Games
Zhixin Liu, Associate Professor, University of Michigan Dearborn, United States

We provide a closed-form Shapley value for a class of single machine sequencing games, and demonstrate its application in a rescheduling game with machine disruption. We evaluate the likelihood for the Shapley value to be a core allocation, and how the Shapley value allocates cost saving among job owners.

- 060-0412** Design of Interactive Scheduling Algorithms
Wout van Wezel, Assistant Professor, University of Groningen, Netherlands

Many advanced scheduling algorithms are described in literature. However, schedulers in practice often still use simple heuristics or even create schedules manually. Interactive scheduling algorithms can help bridge this theory/practice gap. Based on a literature review, we present an overview of advantages and mechanisms of interaction in interactive scheduling algorithms.

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Saturday, 08:00 AM - 09:30 AM, Cardozo

Track: Information in Operations Management*Session:* Information and Service Operations Management*Chair(s):* Emre Demirezen

- 060-0508** Bundled Payments for Healthcare Services: A Framework for the Healthcare Provider Selection Problem
Seokjun Youn, Student, Texas A&M University College Station, United States
Chelliah Sriskandarajah, Professor, Texas A&M University College Station, United States
Subodha Kumar, Professor, Texas A&M University College Station, United States

Identifying competitive healthcare providers is an important issue for the successful operation of bundled payment. We develop a selection framework via data envelopment analysis and combinatorial auction (CA). To evaluate the impact of design issues on the CA performance, we use the hospitals and claims data of TX, USA.

- 060-1186** How Fast to Patch & How Much to Open?
Emre Demirezen, Assistant Professor, Binghamton University, United States
Rakesh Mallipeddi, Student, Texas A&M University College Station, United States
Subodha Kumar, Professor, Texas A&M University College Station, United States
Ram Gopal, Professor, University of Connecticut Storrs, United States

We develop empirical and analytical models to examine the effects of using open source codes on the overall quality of software systems. We also develop an optimal strategy to allocate resources for maintenance of existing software while developing new software and optimal timing of release of new software.

- 060-0072** Inventory Record Inaccuracy: Empirical Characteristics and Analytical Applications
Rogelio Oliva, Associate Professor, Texas A&M University College Station, United States
Howard Hao-Chun Chuang, Assistant Professor, National Chengchi University, Taiwan, Republic of China
Subodha Kumar, Professor, Texas A&M University College Station, United States

Based on data from a retail chain, we adopt continuous-time modeling and econometrics to estimate key drivers of inventory record inaccuracy (IRI) and distributions of error magnitude. We also develop different analytical applications of the empirically estimated characteristics of IRI. Our modeling effort leads to generalizable insights on IRI.

- 060-0098** Call Center Outsourcing under Competition and Information Asymmetry
Ji Yanan, Student, University of science and technology of China, China

This paper studies optimal decisions for call center outsourcing supply chains that consist of a user company and a call center operator. The user company outsources part of his service products to the call center for sale, and has private information about his product quantity.

156	Saturday, 08:00 AM - 09:30 AM, Du Pont	<i>Track:</i> Humanitarian and Not-for-profit Operations
	<i>Session:</i> Game theory applications in humanitarian logistics	
	<i>Chair(s):</i> Jessica Heier Stamm	

060-1130 What Explains Supply Chain Success of Projects in Humanitarian Supply Chains?

Hella Abidi, Student, FOM University of Applied Sciences, Germany
 Sander De Leeuw, Associate Professor, Vrije Universiteit Amsterdam, Netherlands
 Wout Dullaert, Professor, Vrije Universiteit Amsterdam, Netherlands
 Matthias Klumpp, Professor, FOM University of Applied Sciences, Germany

In this research we aim to identify supply chain success of humanitarian operations using data of four humanitarian projects in Afghanistan. We applied network DEA to detect inefficiencies and conclude that examining each process of humanitarian supply chains allow for more resource allocation and support in developing efficiency enhancing strategies.

060-0992 Game Theoretic Models of Decentralized Beneficiary Behavior

Luke Muggy, Student, Kansas State University, United States
 Jessica Heier Stamm, Assistant Professor, Kansas State University, United States

When agencies locate facilities to provide last-mile services, beneficiaries make decentralized decisions regarding which facility to visit. These decisions ultimately determine demand patterns and affect the overall effectiveness of a response. We model this system using a congestion game that integrates individual preferences and quantify inefficiencies that result from decentralization.

060-1024 Inter-organizational Learning in Humanitarian Supply Networks

Ira Haavisto, Lecturer, Hanken School of Economics, Finland
 Gyöngyi Kovács, Professor, Hanken School of Economics, Finland
 Peter Tatham, Professor, Griffith University, Australia

Disasters, and disaster relief, are usually studied case by case. Simultaneously, humanitarian organizations are criticized for a lack of learning from previous disasters. This study examines organizational, and especially, inter-organizational learning in the supply network in light of the disaster management cycle.

157	Saturday, 08:00 AM - 09:30 AM, Embassy	<i>Track:</i> Humanitarian and Not-for-profit Operations
	<i>Session:</i> Modeling not-for-profit supply chains in developing countries	
	<i>Chair(s):</i> Santosh Mahapatra	

060-0694 Humanitarian Supply Chain Management: Case Studies in Qatar

MohdNishat Faisal, Associate Professor, CBE, Qatar University, Qatar

Recently many countries in Arab World are in turmoil. Qatar has been in the forefront of humanitarian efforts, necessitating the redesign of supply chains involved in humanitarian work. This paper looks into the challenges of managing humanitarian supply chains in wake of change of scale and nature of the task.

060-0492 Modelling African Supply Chains from the Seaport to the Hinterland

Dorit Schumann-Bölsche, Professor, University of Applied Sciences Fulda, Germany
 Liliane Streit-Juotsa, Student, University of Applied Sciences Fulda, Germany
 Anna-Mara Schön, Student, University of Applied Sciences Fulda, Germany

Supply Chains in Sub-Saharan Africa work different from the ones in industrialized countries. Specific processes and circumstances have to be considered for humanitarian operations. The paper aims to make African supply chains visible. It focuses on Cameroons seaport in Douala and models the processes with BPMN to the Hinterland.

060-1243 The AAA Humanitarian Operations: Learnings from MA Math's Experience

Santosh Mahapatra, Associate Professor, Clarkson University, United States
 Bhavaneer Rao, Senior Lecturer, Amrita University, India
 Maneesha Sudheer, Associate Professor, Amrita University, India

Humanitarian operations are incredibly challenging. Building on the experience of MA Math, an Indian NGO that has been significantly involved in humanitarian operations after disasters such as tsunami, earthquakes, landslides and floods, this study analyzes the key capabilities for excellent relief, recovery and rehabilitation initiatives over the disaster management cycles.

060-1443 Supply Chain Scalability for Household Water Filters in India

Jarrod Goentzel, Lecturer, Massachusetts Institute of Technology, United States
 Stephen Graves, Professor, Massachusetts Institute of Technology, United States

This study evaluates the supply chain scalability for household water filter devices in India. Using survey data from 108 Gujarati retailers and interviews with supply chain actors we assess products and business models based on nine key attributes. We further analyze the surprising effectiveness of locally branded and assembled products.

158	Saturday, 08:00 AM - 09:30 AM, Fairchild East	<i>Track:</i> Healthcare Operations Management
	<i>Session:</i> Empirical Healthcare Operations	
	<i>Chair(s):</i> Feng (Susan) Lu	

- 060-0510** Do Mandatory Overtime Laws Improve Quality? Staffing Decision and Operational Flexibility in Nursing Homes
Feng Lu, Assistant Professor, Purdue University, United States
Lauren Lu, Associate Professor, University of North Carolina Chapel Hill, United States

During the 2000s, a number of states passed laws that restrict the use of mandatory overtime and cap the maximum work hours for nurses. Using U.S. nursing homes data from 2004 to 2012, we find that the passage of mandatory overtime laws reduces the overall quality in nursing homes.

- 060-0512** Working Smarter, Not Harder: Queue Discretion, Batching, and Performance in Teleradiology
Maria Ibanez, Student, Harvard University, United States
Jonathan Clark, Assistant Professor, Penn State University University Park, United States
Robert Huckman, Professor, Harvard University, United States
Brad Staats, Professor, University of North Carolina Chapel Hill, United States

We examine how knowledge workers exert discretion on the order in which to execute tasks and the subsequent performance implications of those choices. Using data on more than 2.7 million cases read by radiologists, we explore potential heuristics in ordering decisions, and how this endogenous ordering affects performance.

- 060-0579** Managing Variety in Service Firms: Integration vs. Specialization in Hospitals
Stefan Scholtes, Professor, Judge Business School, Great Britain
Ludwig Kuntz, Professor, Faculty of Management, Economics and Social Science, Germany
Sandra Suelz, Lecturer, Faculty of Management, Economics and Social Science, Germany

This paper presents an empirical study of the quality implications of specialization and integration in hospitals. We analyze whether and when each strategy is appropriate and show that for related services, integration is associated with higher quality. Implications are outlined through a counterfactual departmental redesigns based on our sample.

- 060-1732** "Is Technology Eating 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, , University of Rochester, United States

We investigate the impact of health IT adoption on staffing decisions in nursing homes. Both the analytical model and empirical findings suggest that the IT-enabled automation impact on staffing decisions heavily rely on market structures.

159	Saturday, 08:00 AM - 09:30 AM, Fairchild West	Track: Healthcare Operations Management
	Session: Lean and Six Sigma	
	Chair(s): Adrian Choo	

- 060-0150** Measuring Environmental Performance in Hospitals: A Framework and Process
Andreia Pasqualini Blass, Associate Professor, UNIDAVI, Brazil
Sergio Gouvea da Costa, Associate Professor, Pontifical Catholic University of Parana, Brazil
Edson Pinheiro de Lima, Associate Professor, Pontifical Catholic University of Parana, Brazil
Lilian Borges, Associate Professor, Pontifical Catholic University of Parana, Brazil

Since the Brundtland Report (1987), academics and practitioners have been urged to internalize concerns on environmental performance measurement. In healthcare operations, these concerns relate to environmental impact reduction and quality improvements. The study seeks to propose a framework and process that can be used by hospitals to address this issue.

- 060-0495** Fixing Process Problems in Healthcare Using Metaroutines
Manimay Ghosh, Professor, Xavier Institute of Management, India

Organizations when confronted with a process-related problem enact short-term approaches to tide over the immediate crisis resulting in problem recurrence. Some go beyond the superficial reasons to understand the root causes, and produce sustainable results. This paper highlights key characteristics of an effective metaroutine that ensures enduring change.

- 060-0345** Lean Healthcare: Buffers in Practice, Does Quality Matter?
Oskar Roemeling, Student, Rijksuniversiteit Groningen, Netherlands
Martin Land, Associate Professor, University of Groningen, Netherlands

Besides reducing direct waste, a complete lean approach should focus on variability and buffers. In this multiple case study we explore if quality is used as a buffer in healthcare. We investigate bottom up generated lean interventions. Can quality fulfill the buffering roles normally reserved for inventory, time and capacity?

- 060-0301** Learning through Design for Six Sigma Projects in Behavioral Healthcare Settings
Jamison Kovach, Associate Professor, University of Houston, United States
Lawrence Fredendall, Professor, Clemson University, United States
Adrian Choo, Assistant Professor, Georgia State University, United States

Behavioral health services are not an exact science. Some behavioral healthcare providers are starting to use continuous improvement approaches. This research investigates the learning that occurs during Design for Six Sigma projects conducted in behavioral healthcare. Preliminary results from this study will be presented.

160	Saturday, 08:00 AM - 09:30 AM, Gunston East	Track: Manufacturing Operations
	Session: Scheduling and Logistics	
	Chair(s): Ramakrishna Govindu	

- 060-1334** Simulation-enhanced Decision-making in Production Logistics
Günther Schuh, Professor, Rwth Aachen University, Germany
Christina Reuter, Senior Lecturer, RWTH Aachen University, Germany
Anja Weber, Lecturer, Rwth Aachen University, Germany

The volatile environment today's manufacturing companies are facing generates pressure on decision-makers in production logistics. This is the reason why decision-making at the earliest point in time gains significance. The approach presented in this paper reveals how simulation tools can be used to bring forward the time of decision.

- 060-0487** Intelligent Shop Floor Scheduling Using Multi Agent Systems
Minakshi Kumari, Student, Indian Institute of Technology-Delhi, India
Nikhil Chilwant, Student, Indian Institute of Technology-Delhi, India
Anand Prajapati, Student, Indian Institute of Technology-Delhi, India
Makarand Kulkarni, Associate Professor, Indian Institute of Technology-Delhi, India

Production Scheduling becomes more complex as some other function like maintenance gets coupled with it. Multi Agent Systems are considered as intelligent solution providers in such complex decision making environments. The paper presents a conceptual framework for a Multi Agent System for integrated scheduling and maintenance.

- 060-0641** Efficient Heuristics for the Multi-unit Flow Shop Problem
Anurag Agarwal, Professor, University of South Florida, United States
Ramakrishna Govindu, Lecturer, University of South Florida, United States

The traditional flow-shop problem involves a single unit of each job type. But in the real-world flow shop environments, often multiple units must be produced for each type of job. We formulate the multi-unit flow-shop problem and propose some efficient heuristic approaches to solve such problems.

161	Saturday, 08:00 AM - 09:30 AM, Gunston West	Track: Marketing and OM Interface
	Session: Dealing with uncertainties in the supply chain	
	Chair(s): Haoying Sun	

- 060-0114** Information Sharing in Supply Chains: An Empirical and Theoretical Valuation
Ruomeng Cui, Assistant Professor, Indiana University Bloomington, United States
Gad Allon, Professor, Northwestern University, United States
Achal Bassamboo, Associate Professor, Northwestern University, United States
Jan van Mieghem, Professor, Kellogg School of Management, United States

We provide an empirical and theoretical assessment of the value of sharing downstream information. We use the data from a CPG company to show the opposite result from the literature. We propose a new theoretical model allowing decision makers to deviate from given inventory replenishment policy, which reconciles the gap.

- 060-0628** Should the Firm Pre-announce Release Date of New Product?
Haoying Sun, Assistant Professor, Texas A&M University College Station, United States
Subodha Kumar, Professor, Texas A&M University College Station, United States

We study the pre-announcement decision of a manufacturer for the new product. We find that even when the pre-announcement leads to an unfavorable market condition, it may be beneficial. The reason is that it causes the supplier to either reserve the capacity earlier, or to reserve more capacity, or both.

- 060-0632** Strategic Analysis of the Agency Model for Digital Goods
Yinliang (Ricky) Tan, Student, University of Florida, United States
Janice Carrillo, Associate Professor, University of Florida, United States

Firms that manage both traditional and digital goods distribution channels are facing many operational challenges. We investigate the strategic impact of the agency model in comparison with the prevalent wholesale and fixed price models by formulating a dual channel model of distribution accommodating sales of both traditional and digital goods.

- 060-0071** Multi-dimensional Decisions in Operations: An Experiment
Karthik Ramachandran, Assistant Professor, Georgia Institute of Technology, United States
Yusen Xia, Associate Professor, Georgia State University, United States

An essential fact of decisions made under uncertainty, such as in retailing, is that multiple decisions (like price and quantity) are made jointly. In this study, we experimentally examine subjects' performance when they jointly determine price and quantities. We identify various factors that influence decision-making in this context.

162

Saturday, 08:00 AM - 09:30 AM, Coats
Session: Operations and Financial Models
Chair(s): Krishnan Dandapani

Track: Economics Models of Operations**060-1675** Credit Default Spread, Country Rating and Sovereign Debt

Krishnan Dandapani, Professor, Florida International University, United States
Edward Lawrence, Associate Professor, Florida International University, United States

The Determinants of country rating are crucial to both borrower and lender of sovereign debt. What factors affect sovereign debt ratings? What is the linkage between country and sovereign debt ratings? Using the Credit Default Spread we model and empirically explore the relationship for a number of countries over time.

060-1676 Optimal Foreign Exchange Management Policies Using Financial Supply Chain Models

Krishnan Dandapani, Professor, Florida International University, United States
Sushil Gupta, Professor, Florida International University, United States

We examine Foreign Exchange management operation of a multinational, using concurrent development in the financial supply chain models. We examine currency flows which occur from subsidiaries and the optimal distribution mechanism within the constraints of receipts of money. The overall objective is to maximize the Wealth of the multinational corporation.

060-1075 Monte Carlo Simulation in the Shopping Centers Investment Analysis

Claudia Mattos, Assistant Professor, Centro Universitario Da Fei, Brazil
João Chang Junior, Associate Professor, Centro Universitario Da Fei, Brazil
Marcos Cassas, Student, Centro Universitario Da Fei, Brazil

Investment decisions in shopping centers are made by long-term expectations with a view to "in perpetuity" operations. Indeed, investment in malls is characterized by risk. This work presents a model based on cash flow and Monte Carlo's methodologies to evaluate the risk and identify important variables for decision-making.

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Saturday, 08:00 AM - 09:30 AM, Monroe
Session: Managing NPD Teams
Chair(s): Morvarid Rahmani

Track: Product Innovation and Technology Management**060-0315** How Communication and Incentives Transform a Strategic Plan into Action

Jeremy Hutchison-Krupat, Assistant Professor, University of Virginia, United States

This paper acknowledges that senior leadership has two levers, financial incentives and communication, to impact the actions of their direct reports. We study how senior leadership's use of communication and incentives affects their ability to alter an organization's NPD portfolio.

060-0083 Free Riding in Team Projects: The Role of the Leadership Structure

Morvarid Rahmani, Assistant Professor, Georgia Institute of Technology, United States
Guillaume Roels, Associate Professor, University of California Los Angeles, United States
Uday Karmarkar, Professor, University of California Los Angeles, United States

In this paper, we consider a multi-agent NPD project with a finite deadline. We investigate the role of the leadership style (autocratic or democratic) on free-riding in teams and characterize which leadership style is the most efficient depending on the project characteristics.

060-0733 Selling a New Product to Uncertain Customers with Learning Externality

Yufei Huang, Student, University College London, United Kingdom
Onesun Yoo, Assistant Professor, University College London, United Kingdom
Bilal Gokpinar, Assistant Professor, University College London, United Kingdom
Christopher Tang, Professor, University of California Los Angeles, United States

We study a seller's information and pricing strategy when selling a new/innovative product to strategic information-seeking consumers. We present a unified model which enables us to examine the interaction between firm-induced learning, consumer learning, and social learning. We discuss the novel insights and practical managerial implications.

164

Saturday, 08:00 AM - 09:30 AM, Holmead East
Session: Design of Services
Chair(s): Guillaume Roels

Track: Service Operations**060-0119** An Economic Model of Knowledge Outsourcing

Cheryl Gaimon, Professor, Georgia Institute of Technology, United States
Jaeseok Lee, Student, Georgia Institute of Technology, United States
Karthik Ramachandran, Associate Professor, Georgia Institute of Technology, United States

We introduce a game-theoretic model of Knowledge Outsourcing. We study how the interaction between a knowledge buyer and supplier is affected by two salient aspects of knowledge outsourcing, which distinguish it from component outsourcing: the buyer's absorptive capacity, and the supplier's ability to reuse prior knowledge.

- 060-1099** Affects of Value-added Services on the Participation Levels in HIEs
Emre Demirezen, Assistant Professor, Binghamton University, United States
Subodha Kumar, Professor, Texas A&M University College Station, United States
Arun Sen, Professor, Texas A&M University College Station, United States

We study the effects of value-added services on the participation levels in HIEs. We find that costs related to HIE maintenance and value-added services affect whether the HIE is established or not, whereas the heterogeneity among healthcare-practitioners influence the participation levels. We provide several insights for policy-makers, HIE-providers, and healthcare-practitioners.

- 060-1304** The Design of Multi-stage Services
Ioannis Bellos, Assistant Professor, George Mason University, United States
Stylianios Kavadias, Professor, University of Cambridge, United Kingdom

Motivated by the practices of design firms we build on the customer journey concept, which describes services as multi-stage processes. We develop a parsimonious model and we analyze the provider's decisions on the amount of effort she exerts at each stage of the process and the overall price she charges

- 060-1489** Design of Experiential Services with Acclimation and Memory Decay
Guillaume Roels, Associate Professor, University of California Los Angeles, United States
Aparupa Das Gupta, Student, University of California Los Angeles, United States
Uday Karmarkar, Professor, University of California Los Angeles, United States

In this talk, we characterize the optimal design of an experiential service when customers are subject to acclimation and memory decay. We find that, when the encounter is short, crescendo is optimal, whereas when the encounter is long, a U-shape is optimal.

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| 165 | Saturday, 08:00 AM - 09:30 AM, Holmead West | <i>Track:</i> Product Innovation and Technology Management |
| | <i>Session:</i> Information Technology Applications in Innovation Settings | |
| | <i>Chair(s):</i> Balan Sundarakani | |

- 060-0800** The Maturity Level of IT Management to Support Innovation within R&D Centers in Brazil
Romulo Fabricio Junior, Student, CEETEPS, Brazil
Fabio Silva, Student, CEETEPS, Brazil
Napoleao Galegale, Professor, CEETEPS, Brazil
Marilia Azevedo, Professor, Centro Paula Souza, Brazil
Eliane Simoes, Professor, CEETEPS, Brazil
Rodrigo Silva, Student, CEETEPS, Brazil

Innovation is an important factor for R&D centers, it is the goal to be achieved in the development of technological projects. IT plays a fundamental role in this process. This paper seeks to understand the maturity level of IT management to support innovation within R&D centers in Brazil.

- 060-1168** The Risk Management in Software Development Using Agile Methods
Rodrigo Silva, Student, CEETEPS, Brazil
Fabio Silva, Student, CEETEPS, Brazil
Romulo Fabricio Junior, Student, CEETEPS, Brazil

The research about software projects failures shows that this industry has a lot to improve - especially concerning the Risk Management aspect of the projects. This study focus on the Agile Methods as a tool to help the Risk Management and the prevention of failures in software projects.

- 060-1087** Use and Benefits of Planning and Scheduling Techniques in Brazilian IT Projects
Tiago Cruz, Project Manager, Eaes - Fgv, Brazil
Orlando Cattini Junior, Associate Professor, Fundacao Getulio Vargas, Brazil

The paper presents the results of a survey with 55 IT project managers in Brazil to identify if project managers know and utilize time planning management techniques to manage their projects and if these techniques can lead to project success in reaching the original schedule.

- 060-0488** An Innovative RFID Technology Embedded Tracking for Air Passenger Cargo Movement
Balan Sundarakani, Associate Professor, University of Wollongong In Dubai, United Arab Emirates
Sushmera Manikandan, Lecturer, Dubai, United Arab Emirates

This research aims to apply the Radio Frequency IDentification (RFID) technology for tracking the passenger baggies and other cargo shipments during the Airport ground handling operations. After implementation and testing, the resulting data reveals that the RFID technology improves the security, reduces baggage mis-delivery and improves passenger satisfaction.

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| 166 | Saturday, 08:00 AM - 09:30 AM, Kalorama | <i>Track:</i> Supply Chain Management |
| | <i>Session:</i> Competition and Coordination in Supply Chain | |
| | <i>Chair(s):</i> Foad Iravani | |

- 060-0765** Information Preferences in the Supply Chain under Strategic Inventory
Abhishek Roy, Student, University of Texas Austin, United States
Stephen Gilbert, Professor, University of Texas Austin, United States

Guoming Lai, Assistant Professor, University of Texas Austin, United States

We investigate how the possibility of strategic inventory influences the preferences for information sharing in a single retailer – single supplier channel. Among other things, we show that strategic inventory may reverse both firms' preferences regarding the creation of a mechanism for sharing information about retail operations with the supplier.

060-0066 Bundling of Vertically Differentiated Products in a Supply Chain

Minghui Ma, Student, University of Kansas, United States

Suman Mallik, Associate Professor, University of Kansas, United States

We consider a bundling of vertically differentiated products in a supply chain consisting of a single manufacturer and a single retailer. Using a game theoretic model we compare and contrast the two scenarios where the bundle is produced by the manufacturer and by the retailer.

060-0234 Retailer's Forecast Capability Information and Demand Forecast Sharing in Supply Chains

Lakshmi Nittala, Student, University of California San Diego, United States

Hyoduk Shin, Assistant Professor, University of California San Diego, United States

Does it help to know how good the retailer is at forecasting for sharing retailer's demand forecast information with the manufacturer via informal talk under a wholesale price contract? We demonstrate that it can actually hurt the forecast sharing between the retailer and the manufacturer.

060-0061 Supply Chain Coordination in the Presence of Gray Markets and Strategic Consumers

Foad Iravani, Assistant Professor, University of Washington, United States

Hamed Mamani, Assistant Professor, University of Washington, United States

Reza Ahmadi, Professor, University of California Los Angeles, United States

Abuse of channel incentives to divert products to gray markets continues to challenge various companies. We analyze the performance of two classic contracts in the presence of a gray market and propose a class of contracts to coordinate the supply chain. We show that coordination enhances consumer welfare.

167	Saturday, 08:00 AM - 09:30 AM, Jay	Track: Supply Chain Management
	Session: Retail Operations 1	
	Chair(s): Shengqi Ye	

060-0148 Hiding Availability Information to Seek Customer Preferences: The Case of E-tailers

Bharadwaj Kadiyala, Student, University of Texas Dallas, United States

Dorothee Honhon, Assistant Professor, University of Texas Dallas, United States

Canan Ulu, Assistant Professor, Georgetown University, United States

We study the problem of a e-retailer choosing product assortment and learning about consumer preferences from observing sales in a Bayesian fashion. We show that the way inventory availability is displayed on a website has important consequences in terms of learning, when e-tailers collect and analyze customers click stream data.

060-0299 How Can Retailers Benefit from Acquiring Consumer Taste Information?

Arcan Nalca, Assistant Professor, Queens University, Canada

Tamer Boyaci, Professor, McGill University, Canada

Saibal Ray, Professor, McGill University, Canada

In this paper, we identify how a retailer can benefit from acquiring demand information when facing uncertain consumer tastes in the context of national brand and store brand competition. Embedded in this question, we also identify the optimal information sharing strategy for the retailer.

060-0377 Dynamic Management of Opaque Selling with Boundedly Rational Customers

Zhe Yin, Student, Huazhong University of Science & Technology, China

Tingliang Huang, Assistant Professor, University College London, United Kingdom

We study a practically important problem, where a firm sells an opaque product to boundedly rational customers and has to dynamically determine its selling strategies. We characterize the optimal selling policies depending on the market environment.

060-0734 The Impact of Backroom Space in the Retail Supply Chain

Lita Das, Student, Massachusetts Institute of Technology, United States

Edgar Blanco, Professor, Massachusetts Institute of Technology, United States

Yossi Sheffi, Professor, Massachusetts Institute of Technology, United States

Backroom space management and supply chain operations are closely linked. We propose new financial metrics to evaluate the value of backroom space and demonstrate their use in retail supply chain planning and design.

168	Saturday, 08:00 AM - 09:30 AM, Morgan	Track: Supply Chain Management
	Session: Supply Chain and Inventory Management	
	Chair(s): Sila Cetinkaya	

060-1552 The Analysis of Money-back Guarantees in the Presence of Strategic Consumers

Zhaoqiong Qin, Associate Professor, Langston University, United States

This paper studies the benefits of money-back guarantees (MBGs) on the seller in the supply chain under the presence of strategic consumers. We compare the models of the MBGs offer to no-MBGs in the selling season. we find that the seller can charge a higher price in MBGs.

060-1666 The Impact of Inbound Transportation Cost and Capacity on Optimal Inventory Policies under Stochastic Demand

Sila Cetinkaya, Professor, Southern Methodist University, United States

Liqing Zhang, xx, United Airlines, United States

We study a generalization of the stochastic dynamic inventory problem where a private-fleet is used for inbound transportation. We generalize the concept of non-K-decreasing and offer a complete characterization of the optimal policies solving a fundamental stochastic control problem that has remained open in the literature for over four decades.

060-1613 Propagation of a Change through a Supply Chain: Skipping Stones

Janaina Siegler, Student, Fundacao Getulio Vargas, United States

Barbara Flynn, Professor, Indiana University, United States

Mohan Tatikonda, Professor, Indiana University, United States

Luiz Brito, Professor, Fundacao Getulio Vargas, Brazil

Metaphorical transfer is used to align the physics of skipping stones with the propagation of a mid-range change through a supply chain. A theory-constitutive metaphor is developed by showing ontological, analogical, and identity correspondence between stone skipping and supply chain relationships, and then used to develop propositions.

060-1200 Consumer Perceptions of Product Recall Strategies: The Effect of Consumer Attributions on Recall Responsibility

Tracy Johnson-Hall, Assistant Professor, College of William & Mary, United States

Aleda Roth, Professor, Clemson University, United States

Manpreet Hora, Assistant Professor, Georgia Institute of Technology, United States

We study the effect of information provided in product recall announcements on consumer perceptions using a vignette-based experiment. Applying attribution theory, we demonstrate that discretionary information about the circumstances surrounding a product recall influence recall satisfaction and consumer perceptions of firm responsibility. We discuss implications for firms and for policy-makers.

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Saturday, 08:00 AM - 09:30 AM, Northwest

Track: Revenue Management and Pricing

Session: Empirical Models in Revenue Management

Chair(s): Fredrik Odegaard

060-1419 Examining the Impact of Assortment Size and Paid Ads Composition on Consumer Click-through in Sponsored Search

Chris Anderson, Associate Professor, Cornell University, United States

We study assortment size and composition on consumer click-through behavior in sponsored search advertising. Using a unique disaggregate consumer query-level dataset, we apply a three-stage joint distribution modeling approach to examine the impact of query, keyword and advertiser characteristics upon ad performance for both the advertiser and the search engine.

060-1530 Fare Prediction Websites and Transaction Prices: Empirical Evidence from the Airline Industry

Benny Mantin, Assistant Professor, University of Waterloo, Canada

Eran Rubin, Assistant Professor, Holon Institute of Technology (HIT), Israel

Online decision support systems that provide consumers with information about future distributions of prices can facilitate strategic consumer behavior. We empirically demonstrate the magnitude effects of strategic consumer behavior in the context of the airline industry. We find that the availability of such information is associated with lower transacted airfares.

060-0731 Upper Bounds for Choice Network RM

Kalyan Talluri, Professor, Imperial College London, United Kingdom

Sumit Kunnumkal, Assistant Professor, Indian School of Business, India

We establish analytical limits on how much the affine and piecewise linear approximation methods can tighten the deterministic LP bound for choice NRM.

060-1291 Retail Gasoline Pricing with Loyalty Programs and Swap Structures

Fredrik Odegaard, Assistant Professor, The University of Western Ontario, Canada

Daero Kim, Student, University of Western Ontario, Canada

Matt Davison, Professor, University of Western Ontario, Canada

Retail gasoline prices exhibit great variability - both long- and short-term. This paper discusses a model providing customers with price guarantee based on loyalty programs and financial swap structures. The paper presents optimal refueling strategies, analysis of the optimal swap contracts, and empirical analysis from US gasoline retail markets.

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Saturday, 08:00 AM - 09:30 AM, Oak Lawn

Track: Operations Management Practice

Session: Mission Critical Operations Planning I

Chair(s): Kaan Katircioglu

060-0931 Does a Forecast-accuracy Based Allocation Scheme Induce Customers to Share Truthful Forecasts?

Pelin Pekgun, Assistant Professor, University of South Carolina, United States

Minseok Park, Student, University of South Carolina, United States

Pinar Keskinocak, Professor, Georgia Institute of Technology, United States

We investigate the strategic forecasting and ordering behavior of customers, such as inflating forecasts to secure sufficient capacity from their supplier, through behavioral experiments. Our results suggest that rewarding forecast accuracy in allocating inventory can lead to improved forecast sharing, particularly when the supplier communicates his policy to his customers.

060-0938 Shaping Demand for Transitioning Products

Roger Lederman, Research Staff Member, IBM, United States

The talk will discuss tools for shaping demand to better match supply capabilities. The focus is the challenging setting of product transitions, for which we discuss novel customer models and an optimization framework. We also discuss how a staged implementation helped strengthen the tool's adoption and overall business impact.

060-1583 Enhancing Preventive Maintenance Effectiveness – Case Study

Muthukumar Annamalai, Student, National Institute of Industrial Engineering, Mumbai, India

Vivekanand Khanapuri, Professor, National Institute of Industrial Engineering, Mumbai, India

In a highly automated manufacturing, aligning business objectives with Preventive maintenance (PM), reduces down time & ensures quality output. Recommendations for PM effectiveness improvement based on analysis of corrective maintenance work orders, source of loss identification, weekly PM activities along with alignment of spares and resources have benefited this organization.

060-1684 Spare Parts Inventory Optimization

Kaan Katircioglu, Senior Quantitative Analyst, Google, United States

Brian Eck, Quantitative Analyst, Google, Inc., United States

Mike Hsieh, , Google, United States

Brendon Dillon, , Google, United States

Jessica Mok, , Google, United States

Spare parts inventory management has unique challenges in managing uptime of mission critical equipment. We present the problem for fiber optic telecommunication network equipment where a simple hub and spoke system is a reasonable design for spare parts distribution. We provide a model and share the results from implementation.

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Saturday, 08:00 AM - 09:30 AM, Parlor A

Track: General Track

Session: General Operations Management Topics

Chair(s): Darwin Davis

060-0037 The Impact of Big Data Analytics on the Ethics of Customer Relationship

Rafael Novo, Professor, FIAP - Faculdade de Informatica e Administracao Paulista, Brazil

José Neves, Professor, FATEC, Brazil

Marilia Azevedo, Professor, CEETEPS, Brazil

Big Data systems can analyze large volumes of data from Internet browsing patterns and posts on social networks. Use of these data can be useful for businesses and consumers, but can also lead to exposure of customers' personal information without proper policies and well established ethical boundaries for companies.

060-1305 The Special Purpose Companies and the Impacts at the Project Investment of a Brazilian Electric Public Company

Luiz Lubi, Department Advisor, Companhia Hidro Elétrica do São Francisco - Chesf, Brazil

The purpose of this paper is to present the development of the Brazilian electric sector to the actual stage, analysing the impacts of the public-private partnerships through the creation of Special Purpose Companies and its impacts at the project investment of a traditional Brazilian public electric company.

060-1007 Award as an Innovation Public Driver for Small and Medium Entrepreneurs (SMEs) in Brazil

Erica Dias, Student, UFABC, Brazil

Julio Facó, Professor, UFABC, Brazil

Neusa Serra, Professor, UFABC, Brazil

This study investigated SMEs winners of Finep Prize (a Brazilian innovation award for organizations and individuals) in recent years. Using case study and survey techniques, authors were able to compare several aspects of those winners as well as analyze the Prize as public policy instrument to stimulate innovation.

060-0759 Design of Information Structure for Competitive Productivity Benchmarking for a Large Scale Manufacturers in India

Ravishankar Basappa, Professor, BMS College of Engineering Bangalore India, India

Bhaskar Bhandarkar, chairman, IIIE navi mumbai, India

Companies spend good amount of time and money in making departments/divisions work to the expectations of the stake holders. Managers conduct skin deep analyses, conclude about their effort. An information structure will be of immense use. Structures will help decision makers to generate value, right information for an accurate decision.

060-0597 The Statistical Sampling about Levels of Utilization of Multi-criteria Methods to Solve Problems in POM

Isabela Pessoa, Student, Federal University of Technology – Parana, Brazil

Flavio Trojan, Professor, Federal University of Technology – Parana, Brazil
Gilson Oliveira, Professor, Federal University of Technology – Parana, Brazil
Dalmarino Setti, Professor, Federal University of Technology – Parana, Brazil

This paper shows statistical sampling results on levels of utilization of multi-criteria methods for problems in productive environments, operations and management. 820 articles were filtered from 7,725 publications considering publication quality standard in Brazil and Impact Factor. Descriptive statistics was used to represent data and analysis from 2004 to 2014.

173	Saturday, 08:00 AM - 09:30 AM, Parlor B	Track: Risk Management in Operations
	Session: OM-Finance Interface 1	
	Chair(s): Gerd Hahn Shailesh Kulkarni	

060-0286 Tax-effective Design of Global Manufacturing Networks

David Francas, Senior Consultant, Camelot Management Consultants, Germany
Gerd Hahn, Assistant Professor, University of Mannheim, Germany
Shailesh Kulkarni, Associate Professor, University of North Texas, United States

Extending the newsvendor networks approach to multi-national companies, we study the impact of tax-effective transfer pricing on sourcing decisions in global manufacturing networks. While shifting the disposable income to low-tax jurisdictions is (obviously) optimal, we interestingly find two distinct sourcing strategies (single vs. multi-sourcing) depending on the cost parameters.

060-0343 Value Impacts of Supply Chain Management - A Quantitative Model

Marcus Brandenburg, Senior Lecturer, University of Kassel, Germany

Although SCM is identified as a key driver of financial performance, quantifying its influence on company value is difficult and quantitative models to assess value impacts are scant. We formally partition discounted cash flow to four SCM-related value drivers to financially measure and compare impacts of SCM on company value.

060-0613 Real Options: Optimal Freight Procurement Policies in Maritime Shipping

Taimaz Soltani, Student, Eindhoven University of Technology, Netherlands
Arun Chockalingam, Assistant Professor, Eindhoven University of Technology, Netherlands
Jan Fransoo, Professor, Technische Universiteit Eindhoven, Netherlands
Chung-Yee Lee, Professor, Hong Kong University of Science & Tech, China

We consider a firm that needs to ship its order to satisfy uncertain demand. Freight rate is a highly volatile commodity that firm can either procure in the spot market or buy options on it to avoid over-reliance on the volatile market. Its optimal freight procurement policies is discussed in this paper.

060-0857 Global Sourcing under Exchange-rate Uncertainty

Shahryar Gheibi, Student, Syracuse University, United States
Burak Kazaz, Associate Professor, Syracuse University, United States
Scott Webster, Professor, Arizona State University Tempe, United States

We study a firm's capacity reservation decisions in the presence of exchange-rate uncertainty. After observing the exchange rate, the firm determines the production decisions under demand uncertainty. We characterize onshore, offshore, and dual sourcing policies and show that exchange-rate uncertainty can make the firm source only from the high-cost supplier.

174	Saturday, 08:00 AM - 09:30 AM, Columbia 5-8	Track: Meetings & Symposiums
	Session: Practice Leaders Semi-Plenary Session: Operations Strategies	
	Chair(s): Christopher Tang	

060-1711 Operations: Concepts and Issues from Practitioners' Perspective

ManMohan Sodhi, Professor, Cass Business School, United Kingdom
Nicole DeHoratius, Professor, University of Chicago, United States

This session examines different conceptual and practical challenges observed by three practice leaders in Consulting, Information Service, and Consumer Goods Industries. These challenges create research opportunities for OM researchers.

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Saturday, 09:45 AM - 11:15 AM, Columbia 1

Track: Behavior in Operations Management*Session:* Individual factors in operations management*Chair(s):* Michael Becker-Peth

- 060-0191** Decision Making Under Service Level Contracts
Ulrich Thonemann, Professor, Universitat Zu Koln, Germany
Tobias Stangl, Student, University of Cologne, Germany
Gary Bolton, Professor, University of Texas Dallas, United States

Service level contracts are common in practice. By measuring service levels and enforcing penalty payments service level contracts can feature a sharpened expected profit function which makes the economic consequences of deviations from the normative benchmark more severe. We show results of a set of laboratory experiments.

- 060-0352** The Impact of Order Picker Skills on Warehouse Performance
Marek Matusiak, Student, Aalto University, Finland
Rene De Koster, Professor, Erasmus University Rotterdam, Netherlands

We study the impact of differences in picking skills of workers on warehouse performance. Assigning the right worker to the right job has substantial effect on total batch execution time. We use multilevel modeling to forecast batch execution times for individual pickers, and then use these forecasts in picker assignment.

- 060-1644** Overvalued Process Improvement Ideas and Their Antecedents in Organizations
Fabian Sting, Assistant Professor, Rotterdam School of Management, Netherlands
Christoph Fuchs, Associate Professor, Rotterdam School of Management, Netherlands
Maik Schlickel, Independent, Independent, Germany

Ideas by employees are a vital source for innovation. But are such ideas overvalued by their creators? If so, which ideas in particular? Drawing on a unique data set that comprises the generation, selection, and implementation of process improvement ideas of an automotive supplier, we identify antecedents of overvalued ideas.

- 060-1065** Risk Preferences of Informed News vendors
Michael Becker-Peth, Assistant Professor, University of Cologne, Germany
Ulrich Thonemann, Professor, Universitat Zu Koln, Germany

In this paper, we show that risk preferences actually affect ordering decisions (opposed to previous research). But this is only the case if additional information is provided, because people are unable to assess the effect of their order quantity on outcomes due to bounded rationality.

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Saturday, 09:45 AM - 11:15 AM, Columbia 2

Track: Closed Loop Supply Chains*Session:* Topics in Product Acquisition Management*Chair(s):* Akshay Mutha

- 060-0222** Product Acquisition Management – A Third Party Remanufacturer Perspective
Akshay Mutha, Student, Penn State University University Park, United States
Saurabh Bansal, Assistant Professor, Penn State University University Park, United States
Daniel Guide, Professor, Penn State University University Park, United States

We examine various acquisition strategies for a third party remanufacturer (3PR). We first develop a model for the 3PR's profit maximization problem and characterize the optimal solution. Using realistic data for a smartphone remanufacturer, we show that the hybrid acquisition strategy increases the profit by up to 12%.

- 060-0077** The Value of Product Returns: Intertemporal Product Management with Strategic Consumers
Narendra Singh, Student, Georgia Institute of Technology, United States
Ravi Subramanian, Associate Professor, Georgia Institute of Technology, United States
Karthik Ramachandran, Associate Professor, Georgia Institute of Technology, United States

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 time inconsistency problem and that firm profit could increase with the return rate.

- 060-0086** Using Transaction Data to Forecast Consumer Returns
Guangzhi Shang, Assistant Professor, Florida State University, United States
Michael Galbreth, Associate Professor, University of South Carolina, United States
Mark Ferguson, Professor, University of South Carolina, United States

An accurate returns forecast is a key first step to effective management of consumer returns. We develop a transaction-level return forecasting framework and apply it to a large retail dataset. In addition to demonstrating substantial forecasting improvements, we also identify promising managerial actions for lowering the volume of consumer returns.

- 060-0599** Strategic Grading in Used Product Acquisition
Stefan Hahler, Student, University of Mannheim, Germany

Moritz Fleischmann, Professor, University of Mannheim, Germany

We consider a 'recommerce' provider, buying used electronics equipment from consumers. The acquisition price is quality dependent. This implies a negotiation on the applicable product quality. We analyze this process as a sequential game. We also consider the case of incomplete information and test the model on real -life data.

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Saturday, 09:45 AM - 11:15 AM, Columbia 3

Track: Empirical Research in Operations Management

Session: Empirical Research Emerging Issues

Chair(s): Mazhar Arikan

060-0616 Supply Chain: The Counterfeiter's "Playground"

Vidya Mani, Assistant Professor, Penn State University University Park, United States

Christopher Craighead, Associate Professor, Penn State University University Park, United States

The FBI has labeled counterfeiting as the "organized crime of the 21st century" and the supply chain has recently been termed a "counterfeiter's playground." In this research we examined and quantified the damage counterfeiting inflicts on firm performance in the semiconductor industry. Yet, the implications go well beyond this industry.

060-0891 Multi-attribute Loss Aversion and Reference Dependence: Evidence from the Performing Arts Industry

Necati Tereyagoglu, Assistant Professor, Georgia Institute of Technology, United States

Peter Fader, Professor, University of Pennsylvania, United States

Senthil Veeraraghavan, Associate Professor, University of Pennsylvania, United States

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.

060-1079 Healthcare Supply Chain and Its Impact on Performance

Susan Goldstein, Associate Professor, University of Minnesota, United States

Rachna Shah, Associate Professor, University of Minnesota, United States

Albena Ivanova, Associate Professor, Robert Morris University, United States

Multiple organizations often provide healthcare services to a patient during a single treatment process. This empirical study investigates healthcare supply chain structure (the nature of relationships among hospitals and other service providers) and its impact on performance.

060-0688 The Impact of Baggage Fees on Operational Performance of Airlines

Mazhar Arikan, Assistant Professor, University of Kansas, United States

Mariana Nicolae, Assistant Professor, Eastern Michigan University, United States

Vinayak Deshpande, Associate Professor, University of North Carolina Chapel Hill, United States

Mark Ferguson, Professor, University of South Carolina, United States

We examine the impact of baggage fees on departure delay performance by employing an event study methodology. We find that the implementation of checked bag fees improved the departure delay performance for the airlines that implemented the fee as well as the airlines that did not charge for baggage fees.

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Saturday, 09:45 AM - 11:15 AM, Columbia 4

Track: Retail Operations Management

Session: Traditional Retail Channel: Nanostores

Chair(s): Jan Fransoo

060-0862 Selling to Nanostores

Jiwen Ge, Student, Eindhoven University of Technology, Netherlands

Dorothee Honhon, Assistant Professor, University of Texas Dallas, United States

Jan Fransoo, Professor, Technische Universiteit Eindhoven, Netherlands

Lei Zhao, Associate Professor, Tsinghua University, China

Nanostores are small retail stores which are prevalent in mega-cities. Consumer Packaged Goods manufacturers frequently send salespersons to visit nanostores and generate sales. We build MDP models to optimize a manufacturer's sales effort strategy while considering the suboptimal behavior of the nanostores. Optimal policies and parametric results are derived.

060-1219 Selling to the Nanostores: Optimal Inventory and Credit Provision Policy

Wei Luo, , IESE Business School, Spain

Jan Fransoo, Professor, Technische Universiteit Eindhoven, Netherlands

Zumbul Atan, Assistant Professor, Eindhoven University of Technology, Netherlands

This paper studies the supplier's joint inventory and trade credit policy while selling to cash-constrained nanostores, who in turn extend credit to the end customers.

060-0766 Cosmetic Consultant as a Direct Retailer: A Perspective of Social Network Analysis

Mark Tunu, Student, USCS, Brazil

Antonio Silva, Student, Universidade De Sao Paulo, Brazil

Milton Farina, Professor, USCS, Brazil

The retailing market has becoming economically important since the first decade of the 21st century. In the cosmetic retailing, for example, one aspect plays a key role: the direct cosmetic consultant. In this study it was adopted the perspective of social networking analysis for the purpose of determining his/her importance.

- 060-1719** Replenishment Strategies for Micro-Retailers in Developing Countries
Kairen Zhang, Student, Chinese Univ of Hong Kong, Hong Kong
Christopher Tang, Professor, University of California Los Angeles, United States

To improve cost efficiency for distribution channels in developing countries, we consider the case in which the retailers work together to develop a "hybrid" replenishment strategy under which a designated retailer will act as a wholesaler and serve as a retailer at the same time.

- 060-1198** An Integrated Model for Joint Optimization of Inventory and Display Space of Multiple Shelves in Retail Store
Bhavin Shah, Associate Professor, Indian Institute of Management Indore, India
Hasmukh Gajjar, Associate Professor, Indian Institute of Management Indore, India

Managing shelf space along with inventory in retail store is a challenging task warranting joint planning for both that offers more benefits to the retailer. In this paper, an integrated model for joint optimization of inventory and display space is proposed. A solution methodology is developed that yields superior results.

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| 179 | Saturday, 09:45 AM - 11:15 AM, Columbia 9 | <i>Track:</i> Scheduling and Logistics |
| | <i>Session:</i> Distribution Decisions | |
| | <i>Chair(s):</i> Lijian Chen | |

- 060-0102** Collaborative Food Distribution: Considering Economic and Environmental Aspects
Vahid Mirzabeiki, Assistant Professor, Cranfield University, United Kingdom
Nicolas Danloup, Student, University of Artois, France
Hamid Allaoui, Professor, University of Artois, France
Gilles Goncalves, Professor, University of Artois, France

The purpose of the paper is to develop a framework for distribution of food from a distribution centre to several retailers, by considering both the cost of the distribution operations and also the emissions from the logistics activities. Research is conducted using a combination of case study and mathematical modelling. This paper is presenting a part of the research conducted through the project Step Change in Agri-Foods Ecosystems (SCALE), funded by INTERREG IVB North-West Europe.

- 060-0090** A Robust Distribution Policy under Inaccurate Inventory Records
Ming Li, Student, Southeast University, China
Zheng Wang, Professor, Southeast University, China
Haoxun Chen, Professor, University of Technology of Troyes, France
Wenliang Chen, Student, Southeast University, China

A robust distribution problem is investigated for a single warehouse and multiple retailers system with random demands and inventory inaccuracy. A robust distribution policy aiming to minimize total distribution cost is proposed, which makes decisions on distribution route and delivery quantity dynamically according to the probability distributions of inventory levels.

- 060-0959** Integrated Scheduling of Order Picking and Delivery under B2C E-commerce
Xuping Wang, Professor, Dalian University of Technology, China
Jun Zhang, Student, Dalian University of Technology, China

It is an important issue to integrate the order picking with delivery problem under shorter time. We propose a nonlinear mathematical model to solve the joint decision-making problem such as order picking sequence, picking strategy and vehicle routing. A three-phase heuristic algorithm is designed to solve the NP-hard problem.

- 060-1361** Chance-constrained Multi-product Inventory Routing Problem
Lijian Chen, Assistant Professor, University of Dayton, United States
Wen-Chyuan Chiang, Professor, The University of Tulsa, United States
Robert Russell, Professor, University of Tulsa, United States

The supply chain risk issues for the distribution and inventory control achieved through a vendor-managed inventory system has attracted attention. To assure availability of a certain combination of goods, the routing and inventory decision problem is formulated as a chance-constrained optimization problem. We propose solution techniques and discuss managerial implications.

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| 180 | Saturday, 09:45 AM - 11:15 AM, Columbia 10 | <i>Track:</i> Healthcare Operations Management |
| | <i>Session:</i> Scheduling and Hospital inpatient flow | |
| | <i>Chair(s):</i> Hari Balasubramanian | |

- 060-1181** Admission Control in a Network of ICUs and PCU/IMC Units Based on Patient Mortality Risk
Amir Meisami, Student, University of Michigan Ann Arbor, United States
Jivan Deglise-Hawkinson, Student, University of Michigan Ann Arbor, United States
Mark Cowen, Chief, Clinical Decision Services, Quality Institute, Saint Joseph Mercy Health System, United States
Jennifer Czerwinski, Systems Analyst, Quality Institute, Saint Joseph Mercy Health System, United States

Mark van Oyen, Professor, University of Michigan Ann Arbor, United States

Our new method for admission control of patients to ICUs and Progressive Care Units is based on treatment needs and acuity as usual; however, a personalized mortality risk metric selectively provides a higher level of care to the most needy patients using a MIP optimization of the stochastic queueing network.

060-1667 Stochastic Modeling of Operating Room Schedules in Elective Surgery Hospitals

Harsha Honnappa, Lecturer, Purdue University, United States

Rahul Jain, Lecturer, University of Southern California, United States

Naumaan Nayyar, Student, University of Southern California, United States

We investigate the problem of producing a daily block allocation of surgeries in a medium-sized hospital, that serves only elective surgeries. The scheduling problem is influenced by uncertainty in block demand. We present statistical analyses of the current performance and a stochastic model used to produce efficient schedules.

060-0357 Quantifying the Impact of Care Coordination on Health Outcomes

Vishal Ahuja, Assistant Professor, Southern Methodist University, United States

Hari Balasubramanian, Assistant Professor, University of Massachusetts Amherst, United States

This paper quantifies the impact of care coordination on patient health outcomes, using data on outpatient health encounters for diabetes patients. Considering that a PCP's task is to consciously facilitate the patient's navigation of the health system, we use the number of PCP visits as a proxy for care coordination.

060-1156 Outpatient Appointment Scheduling: Challenges and Opportunities in Korea

Kwon Gi Mun, Student, Rutgers University, United States

Yao Zhao, Associate Professor, Rutgers University, United States

Endre Boros, Professor, Rutgers University, United States

Health-care spending in Korea has jumped rapidly up while the rate of patient satisfaction and profit are going down significantly. We review a healthcare policy of Korea, and also study the problem of scheduling in multi divisions. A model and results are verified using data from a Korean public hospital.

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Saturday, 09:45 AM - 11:15 AM, Columbia 11

Track: Tutorials and Panel Discussions

Session: Frontier Analytics for Practical Production and Operations Management

Chair(s): David Yao George Shanthikumar

060-1696 Risk Analytics

David Yao, Professor, Columbia University, United States

This tutorial provides a survey on risk analytics as a fundamental tool---applying analytical methods to turn data into models and optimal decisions---much the same way as business analytics has in recent years supported, with considerable success, the end-to-end supply chains of most enterprises. The difference between the two also makes them distinctly complementary to each other. The focus of business analytics is on issues of productivity and efficiency: cost savings and revenue/profit optimization; whereas the emphasis of risk analytics is on issues of sustainability and resiliency: risk-return tradeoff, disaster mitigation, and related resource allocation decisions and hedging strategies. Some of the applications we shall focus on include: resilient urban infrastructures, resilience financing and insurance, analytics for entrepreneurship and innovation, and healthcare analytics.

060-0001 Panel Discussion on Frontier Analytics

David Yao, Professor, Columbia University, United States

George Shanthikumar, Professor, Purdue University, United States

Vaidyanathan Ramaswami, Vice President, Strategy & Research, Color EyeQ, United States

Qi Feng, Associate Professor, Purdue University, United States

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Saturday, 09:45 AM - 11:15 AM, Columbia 12

Track: Global Operational Issues

Session: Dynamic pricing and contract design for low carbon supply chains

Chair(s): Yanju Zhou

060-0806 Research on Dynamic Price of New Products' Advance Selling: Based on the Consumer Strategy Behavior

Xiongwei Zhou, Associate Professor, Central South University, China

Tinghua Wang, Student, Central South University, China

It mainly analyzes the effects of sellers' decisions on consumer strategic behavior by considering a dynamic price model of preordering period and retailing period. And the formation mechanism of optimal prices is also explored. It is concluded that postponing a purchase of strategic consumer can't always reduce seller total revenue.

060-1167 Price of International Transfer: Comparative Analysis of the Methods in the Brazilian Chemical Industry

Clovis Galdino, Professor, Universidade Anhanguera, Brazil

Joao Santos Filho, Professor, Universidade Anhanguera, Brazil

Adineuza Prates, Student, Universidade Anhanguera, Brazil

Juliana Araújo, Student, Universidade Anhanguera, Brazil

Mariana Ribeiro, Student, Universidade Anhanguera, Brazil

Vanessa Souza, Student, Universidade Anhanguera, Brazil

Trade relations between companies based in tax havens, involving transfers of goods and services, which require the application of the concept of transfer pricing under the legal point of view. The objective was to determine whether the taxation methods were best suited to reduce the risks according to Brazilian law.

060-1401 Research on Model of City Logistics Network and Effects of Different Carbon Policies
Jianhua Yang, Professor, University of Science and Technology Beijing, China

A programming model for a four-layer urban logistics distribution network is constructed and revised under three types of carbon emissions policies such as Carbon tax, carbon emissions Cap, Carbon Trade. Effects of different policies on logistics costs and carbon emissions is analyzed under a spatial Logistics Infrastructure layout of Beijing.

060-1103 Production System Design in a Global Manufacturing Context: A Case Study of a Global Contract Manufacturer
Farhad Norouzilame, Project Manager, LEAX Group, Sweden
Anna Granlund, , Mälardalen University, Sweden
Jessica Bruch, Assistant Professor, Mälardalen University, Sweden

The aim of this paper is to study the process of production system design in order to identify when and how network capabilities could and should be considered during this process. A case study, investigating the production system design process of a global contract manufacturer has been conducted.

183	Saturday, 09:45 AM - 11:15 AM, Piscataway	<i>Track:</i> Inventory Management
	<i>Session:</i> Inventory Management in Supply Chain Networks	
	<i>Chair(s):</i> Yehua Wei	

060-0387 Increasing Supply Chain Robustness through Process Flexibility and Inventory
Yehua Wei, Assistant Professor, Duke University Durham, United States
He Wang, Student, Massachusetts Institute of Technology, United States
David Simchi-Levi, Professor, Massachusetts Institute of Technology, United States

In this talk, we propose a model to determine the optimal inventory placement when the supply chain network has process flexibility and the plants are subject to disruption. We show the model is computational tractable. We also analyze the model to derive several insights on the K-chain flexibility designs.

060-0888 Robust Inventory Routing
Dimitris Bertsimas, Professor, Massachusetts Institute of Technology, United States
Swati Gupta, Student, Massachusetts Institute of Technology, United States
Joel Tay, Student, Massachusetts Institute of Technology, United States

We consider the finite horizon inventory routing problem with uncertain demand. Current techniques that solve an exact formulation of this problem with stochastic demand do not scale to large problems. We propose an efficient and scalable algorithm via robust and adaptive optimization, and present very promising computational results.

060-0932 Strategic Safety Stock Placement in Supply Networks with Static Dual Supply
Steffen Klosterhalfen, Operations Research Specialist , BASF, Germany
Stefan Minner, Professor, Technische Universität München, Germany
Sean Willems, Associate Professor, Boston University, United States

Many real-world supply networks source required materials from multiple suppliers. Existing multi-echelon inventory optimization approaches either restrict their scope to multiple supply sources in two-echelon systems or single suppliers in multi-echelon systems. We develop an exact mathematical model for static dual supply in a general acyclic N-echelon network structure.

184	Saturday, 09:45 AM - 11:15 AM, Cardozo	<i>Track:</i> Information in Operations Management
	<i>Session:</i> Behavioral and Empirical Models for Information Management	
	<i>Chair(s):</i> Manoj Vanajakumari	

060-0515 Information, Cognition and Bullwhip effect
Arunachalam Narayanan, Assistant Professor, University of Houston, United States
Brent Moritz, Assistant Professor, Penn State University University Park, United States

In a recent study, the degree of underweighting the supply line is shown to be linked to an individual's level of cognitive reflection (CR). Also, prior research has shown that sharing information mitigates bullwhip effect. Using a large experiment, we evaluate the interaction between information sharing and individual's cognitive profile.

060-0913 Intra-firm Co-opetition with External Supplier
Haoying Sun, Assistant Professor, Texas A&M University College Station, United States
Manoj Vanajakumari, Associate Professor, Texas A&M University College Station, United States
Subodha Kumar, Professor, Texas A&M University College Station, United States

We study intra-firm coordination and cooperation issues. The two business units of the company has the option of using the raw materials produced by each other or purchasing from third party suppliers. Benefits of buying internally is negated by reduced output of the finished goods. We provide the equilibrium solutions.

060-0307 The Effect of Correlated User Preferences on the Diffusion of New Products

Nachiketa Sahoo, Assistant Professor, Boston University, United States

Nitin Joglekar, Associate Professor, Boston University, United States

Kellas Cameron, Student, Boston University, United States

We study the impact of shared user-preferences across similar products on the diffusion of those products in a consumer population. Using a product rating dataset we show that by learning the user preferences using techniques used to make personalized recommendations a firm can better model diffusion and improve demand forecast.

060-1375 Management of Scientific Knowledge through an Intelligent System

Jose Arrazola, Student, National University of Honduras, Honduras

Cesar Ortega, Student, Universidad Nacional Autónoma de Honduras, Honduras

Julio Zavala, Student, National University of Honduras, Honduras

This paper proposes an intelligent system that manages the production of scientific knowledge by actors of the quadruple helix in Honduras (government, business, academy, society), framed in the research of the value and supply chains, consisting of search, creation, storage, transfer and implementation of knowledge within RDI production.

185	Saturday, 09:45 AM - 11:15 AM, Du Pont	<i>Track:</i> Humanitarian and Not-for-profit Operations
	<i>Session:</i> Decision Making in Humanitarian Response	
	<i>Chair(s):</i> Jarrod Goentzel	

060-1412 Processes and Models for Locating and Sizing FEMA's Disaster Recovery Centers

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

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

Julia Moline, Program Analyst, Federal Emergency Management Agency, United States

We create a data-driven decision process for FEMA's program to establish and manage Disaster Recovery Centers (DRCs). We use historical data for thresholds, processes, and models to dynamically optimize the location and size of DRCs. Application to recent disaster scenarios shows significant cost reductions while providing sufficient capacity for survivors.

060-1424 Analyzing Twitter Data for Situational Awareness During a Disaster

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

Lauren Seelbach, Student, Massachusetts Institute of Technology, United States

Robert Munro, Chief Executive Officer, Idibon, United States

This research presents a replicable methodology for conducting analysis on unstructured Twitter data and considers the effort required to use results for situational awareness in a disaster. We use Natural Language Processing (NLP) to analyze transportation outages during Hurricane Irene in 2011 compared with transportation agency data in four states.

060-1294 Modeling Disaster Response Operations Inter-organizational Communication Structures and Processes

Susan Heath, Assistant Professor, Naval Postgraduate School, United States

Deborah Gibbons, Associate Professor, Naval Postgraduate School, United States

We use agent-based simulation modeling to investigate the impact of different inter-agency communication structures and processes on disaster response operations. Results identify ways to improve the amount of relevant information provided to each organization while reducing the amount of time invested in communication as well as information overload.

060-1439 Defining Product Standards in the Ebola Response

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

Marianne Jahre, Professor, BI Norwegian Business School, Norway

Ian Heigh, Head of Planning and Operations Support, Avenir Analytics, Ltd., Cyprus

The Ebola epidemic response relied on consistent supply of personal protective equipment (PPE) for workers on the front lines. The global community struggled with formalizing PPE specifications, slowing supply chains. We investigate this case to understand the challenges and impacts in defining product standards among technical and logistical communities.

186	Saturday, 09:45 AM - 11:15 AM, Embassy	<i>Track:</i> Information in Operations Management
	<i>Session:</i> The Role of Leadership in Improving Health Care Delivery Quality	
	<i>Chair(s):</i> Geoffrey Parker	

060-1488 The Effectiveness of Management-by-Walking-Around

Anita Tucker, Associate Professor, Brandeis International Business School, United States

Sara Singer, Associate Professor, Harvard University, United States

Management-by-walking-around is a widely adopted technique in hospitals that involves senior managers directly observing frontline work. Few studies rigorously examine its impact. This study examines an MBWA-based improvement program. Findings suggest that senior managers' physical presence in their organizations' front lines was not helpful unless it enabled active problem solving.

060-1534 Role of Bottom-up Decision Processes in Improving Delivery of Care Quality: A Contingency Perspective

Claire Senot, Assistant Professor, Tulane University, United States

Aravind Chandrasekaran, Assistant Professor, Ohio State University, United States

Peter Ward, Professor, Ohio State University, United States

Organizational antecedents to combining conformance and experiential quality are identified using a mix of methods.

060-1689 The Platform Shift in Healthcare

Geoffrey Parker, Professor, Tulane University, United States

Network platform systems have reshaped the computer and telecommunications industries and are now transforming other industries such as transportation, lodging, and contract labor. The shift to platforms is slower in highly regulated industries, but pressures are mounting. We survey likely mechanisms and entry points for a platform shift in healthcare.

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Saturday, 09:45 AM - 11:15 AM, Fairchild East

Track: Healthcare Operations Management

Session: Operations Analysis of Chronic Disease Management

Chair(s): Tinglong Dai

060-0478 Dynamic Learning of Patient Response Types

Diana Negoescu, Assistant Professor, University of Minnesota, United States

Kostas Bimpikis, Assistant Professor, Stanford University, United States

Margaret Brandeau, Professor, Stanford University, United States

Dan Iancu, Assistant Professor, Stanford University, United States

We optimize treatment policies for a class of chronic diseases where measurements of treatment effectiveness are noisy and where negative health events occur with frequencies that depend on patient response type. We find analytic expressions for adaptive treatment policies and illustrate their performance in a case study on multiple sclerosis.

060-0554 No-show and Recurrence Prediction of Breast Cancer Patients

Daniel Gartner, Student, Carnegie Mellon University, United States

Rema Padman, Professor, Carnegie Mellon University, United States

No-show and recurrence prediction is a challenge especially for developing countries like India. Using Machine Learning methods such as Markov blanket attribute selection and classification, we evaluate to what extent structured and unstructured documented demographic and clinical factors can be used to predict follow-up no-shows and recurrence.

060-0565 Diagnosis Decision-making in Percutaneous Coronary Interventions

Tinglong Dai, Assistant Professor, The Johns Hopkins University, United States

Xiaofang Wang, Associate Professor, Renmin University of China, China

Chao-Wei Hwang, Assistant Professor, The Johns Hopkins Hospital, United States

With the rapidly rising cost of health care, there is a renewed urgency for reducing inappropriate use of percutaneous coronary interventions (PCI). In this work, we provide a quantitative analytical model of clinical and non-clinical factors influencing PCI decision-making processes.

060-1336 Comparing Clinical Forecasting Models to Predict Depression among Diabetes Patients

Shinyi Wu, Associate Professor, University of Southern California, United States

Haomiao Jin, Student, University of Southern California, United States

To improve under-diagnosis of depression, this study presents an individualized clinical forecasting model derived from two depression care improvement trials among diabetes patients using machine learning methods. Comparison of AUROC shows the model compares favorably to a couple of clinical heuristic rules to identify patients at elevated risk for depression.

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Saturday, 09:45 AM - 11:15 AM, Fairchild West

Track: Healthcare Operations Management

Session: Emergency department and ambulance

Chair(s): Ken Klassen

060-1518 Resilience in the Emergency Department as an Endogenous, Dynamic Phenomenon

Brad Morrison, Associate Professor, Brandeis International Business School, United States

Robert Wears, Professor, University of Florida, United States

Using ethnographic observation of how people in the ED system of a large, inner-city teaching hospital cope with chronic overload to achieve resilience, we develop a system dynamics model of resilience as an endogenous, dynamic phenomenon and generate important insights for theorizing about resilience in healthcare systems and more broadly.

060-1246 Managing Emergency and Referral Ambulance Services Operation Using GIS

Shirishkumar Gedam, Associate Professor, Indian Institute of Technology Bombay, India

Karuna Jain, Professor, National Institute of Industrial Engineering, Mumbai, India

A centralised call centre based approach is initiated to provide emergency and referral ambulance services in rural areas of Maharashtra, India. The challenges faced in deploying such services are discussed. A GIS based solution is proposed to find fastest route to reach nearest hospital from incident spot.

060-0533 Analyzing Emergency Department Frequent Utilizations for Non-emergent Demands

Rafael Diaz, Associate Professor, Old Dominion University, United States
Joshua Behr, Associate Professor, Old Dominion University, United States
Seth Weinberg, Assistant Professor, Old Dominion University, United States
Katherine Palacio, Associate Professor, Universidad del Norte, Colombia

This research examines predisposing, enabling, and need factors associated with increasing levels of emergency department utilization by non-emergent demands. Interventions targeting these factors will change emergency department encounters while providing alternative ambulatory venues options that offer continuity care services. Interventions to address predisposing factors, may result in decreased utilization.

060-0321 Phlebotomy Process Improvement Using Lean, Six Sigma and Simulation

Yunqu Huang, Student, Brock University, Canada
Ken Klassen, Professor, Brock University, Canada

Although phlebotomy is extremely common in hospitals, very few process improvement efforts have been reported. The phlebotomy process in an ED department is studied using a combination of methods. A number of improvements are suggested, and a framework is developed based on the methodology to guide future improvement efforts.

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Saturday, 09:45 AM - 11:15 AM, Gunston East

Track: Meetings & Symposiums

Session: Meet the Editors 2

Chair(s): Aleda Roth Kalyan Singhal

060-1695 Meet the Editors

M Johnson, Professor, Vanderbilt University, United States
Kalyan Singhal, Professor, University of Baltimore, United States

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.

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Saturday, 09:45 AM - 11:15 AM, Gunston West

Track: Marketing and OM Interface

Session: Supply Chain Competition and Coordination

Chair(s): Gangshu Cai

060-0560 Assortment Planning in the Presence of Variety Seeking

Yanzhi Li, Associate Professor, City University of Hong Kong, Hong Kong
Zhaowei Miao, Professor, Xiamen University, China
Huiqiang Mao, Student, Xiamen University, China

This paper explores the optimal assortment planning when the customers are variety seeking. In a dynamic setting, we examine the optimal assortment planning for a retailer. The findings are interesting and very different from what's been found in the literature, which has focused on a static setting.

060-0864 Stockout Recovery under Consignment: The Role of Inventory Ownership in Supply Chains

Kefeng Xu, Associate Professor, University of Texas San Antonio, United States
Rui Yin, Associate Professor, Arizona State University Tempe, United States
Yan Dong, Assistant Professor, University of South Carolina, United States

We examine how a supply chain firm may implement an incentive contract under inventory consignment to recover stockouts and to retain customers. We formulate principal-agent models to capture the strategic interactions in a supply chain and explore the impact of supply chain opportunisms on the value of inventory consignment.

060-0946 Managing Competition and Cooperation in Supply Chains

Yuhong He, Assistant Professor, Clemson University, United States
Saibal Ray, Professor, McGill University, Canada
Shuya Yin, Associate Professor, University of California Irvine, United States

Upstream suppliers often need to decide whether or not to reply on dominant retailers in the market place when they sell through the downstream partners. We propose an economic model to gain some understanding of the basic trade-offs involved in such decision making processes.

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Saturday, 09:45 AM - 11:15 AM, Coats

Track: Economics Models of Operations

Session: Shaping Demand and Supply with Innovative Selling Policies

Chair(s): Robert Swinney

060-0171 Inventory Pooling and Consumer Behavior

Robert Swinney, Associate Professor, Duke University Durham, United States

We identify two types of consumer behavior that can be impacted by a firm's inventory pooling strategy--strategizing over whether and when to visit a store and purchase a product--and illustrate how the value of pooling is affected by such behavior. Surprisingly, pooling may decrease firm profit under either behavior type.

060-0172 Dynamic Matching in a Two-sided Market

Ming Hu, Assistant Professor, University of Toronto, Canada

Yun Zhou, Student, University of Toronto, Canada

A two-sided market often shares a common structure that engages three parties: the supply side, the demand side and an intermediate firm. We propose a general framework of dynamically matching supply with demand by the intermediary firm and explore the optimal and heuristic matching policies.

060-0258 Strategic Consumers, Revenue Management, and the Design of Loyalty Programs

So Yeon Chun, Assistant Professor, Georgetown University, United States

Anton Ovchinnikov, Associate Professor, Queens University, Canada

We study an interaction between revenue management and premium-tired loyalty programs, and the role of strategic consumers. We compare quantity-based and spending-based loyalty program designs and show that when the firm coordinates its revenue management and loyalty program, it can, in fact, benefit from strategic consumer behavior.

060-1146 The Economics of Uber

Kaitlin Daniels, Student, University of Pennsylvania, United States

Gerard Cachon, Professor, University of Pennsylvania, United States

Ruben Lobel, Assistant Professor, University of Pennsylvania, United States

We study market in which capacity is "distributed" - firms rely on the aggregation of independent, autonomous units of capacity. We use the ride-sharing service, Uber, as our primary application. We study driver recruitment and participation in this distributed capacity model and driver reaction to demand-contingent wage and price schedules.

192	Saturday, 09:45 AM - 11:15 AM, Monroe	Track: Product Innovation and Technology Management
	Session: PITM Education Panel: <input type="checkbox"/> Innovating B-School Education	
	Chair(s): Sebastian Fixson	

060-1122 Learn by Doing: Lean for Social Innovation

Wiljeana Glover, Assistant Professor, Babson College, United States

Online platforms may be ineffective in teaching hands-on POM concepts, e.g., lean's "learn by doing." Translating this practice to the classroom requires close collaboration with industry. This presentation highlights lessons learned from the Lean for Social Innovation course at Babson College supported by the Toyota Production System Support Center (TSSC).

060-1249 Teaching Interdisciplinary Product Design

Jennifer Bailey, Assistant Professor, Babson College, United States

We will share our experiences teaching an interdisciplinary product design course. The course is a collaboration across three independent colleges: Babson College, Olin College of Engineering and Massachusetts College of Art and Design. The course is co-taught by faculty from each of the three colleges.

060-1258 Experiential Learning through Internships in Innovation-labs

Sihem Ben Mahmoud-Jouini, Associate Professor, Hec Paris, France

We will present and reflect on a master program in innovation that has been running for twelve years. It is designed around an experiential learning experience: a specific innovation project to be developed within a firm. The program mixes students from two backgrounds : business and Sci.&Techno.

060-1438 Innovation and Product Development

Jeremy Hutchison-Krupat, Assistant Professor, University of Virginia, United States

Raul Chao, Assistant Professor, University of Virginia, United States

In this session we will discuss some of the teaching activities at Darden relating to innovation and product development.

060-1477 Creating Space for Innovation

Sebastian Fixson, Associate Professor, Babson College, United States

Victor Seidel, Assistant Professor, Oxford University, United Kingdom

Jennifer Bailey, Assistant Professor, Babson College, United States

What is the effect of physical space on teaching and learning how to innovate? In this presentation we consider how to design a physical space most conducive to learning the innovation process. We present the design of one space, the Babson "Design Zone" that takes into account these requirements.

193	Saturday, 09:45 AM - 11:15 AM, Holmead East	Track: Service Operations
	Session: Service Design: Delivery Processes, Technology, and Innovations	
	Chair(s): Enrico Secchi	

060-0201 The Influence of Surprise and Anticipation on Peak and End Effects in Service Operations

Michael Dixon, Assistant Professor, Naval Postgraduate School, United States

Liana Victorino, Associate Professor, University of Victoria, Canada

Rohit Verma, Professor, Cornell University, United States

Robert Kwortnik, Associate Professor, Cornell University, United States

The peak event of a service design often significantly influences customer evaluations of the experience. Using an online-storyboard-experiment, we vary when the peak occurs and examine how customer perceptions were affected when the peak is designed to be a surprise compared to one that is anticipated.

- 060-0354** Towards a Theory of Service Improvisation Competence: Evidence from the Hospitality Industry
Enrico Secchi, Assistant Professor, University of Victoria, Canada
Aleda Roth, Professor, Clemson University, United States
Rohit Verma, Professor, Cornell University, United States

This paper develops and tests the construct of Service Improvisation Competence (Serv-IC) as a deliberate strategy to improve service delivery. Serv-IC reflects the ability of service employees to deviate from established routines to accommodate unexpected events. We find that Serv-IC results in higher customer satisfaction in lower-tier service settings.

- 060-0892** Resource Utilization, Penalty Attribution, and Task Compliance: A Behavioral Investigation
Brett Massimino, Assistant Professor, Cornell University, United States
James Hill, Associate Professor, Ohio State University, United States
John Gray, Associate Professor, Ohio State University, United States
Elliot Bendoly, Associate Professor, Emory University, United States

We examine human behaviors in a hierarchical, multitasking environment with discretionary task switching. We examine the interactions of resource utilization and penalty types (group vs. individual) for task non-performance on task performance behaviors. We frame our study in the realm of non-IT workers performing routine Information Security processes.

- 060-1316** A Comparative Analysis of Experts and Customers' Usage and Utility of Technology-based Innovations in Services
Min Kyung Lee, Student, Clemson University, United States
Rohit Verma, Professor, Cornell University, United States
Aleda Roth, Professor, Clemson University, United States

Use of technologies in service encounters can enhance service delivery and increase customer satisfaction in services. This empirical study presents a richer understanding of experts and customers' usage and utility for technology-based innovations in the US restaurant industry.

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| 194 | Saturday, 09:45 AM - 11:15 AM, Holmead West | <i>Track: Service Operations</i> |
| | <i>Session: Service Management in Hotels and Banking</i> | |
| | <i>Chair(s): Luis Borges</i> | |

- 060-0667** Study of the Application of Continuous Improvement Techniques in Hotel Industry in Medellin
Juan Arrieta - Posada, Professor, Universidad Eafit, Colombia
Juliana Arango-Urbe, Student, Universidad EAFIT, Colombia

Hotel Industry is considered one of the leading sources of employment generation in Colombia. The growth of this sector demands a better commitment of the companies involved. The objective of this work is to identify which LEAN techniques are applied inside different hotels located in the city of Medellin

- 060-1306** Linking Resource Configurations with Performance through Thick and Thin: A Longitudinal Study in the US Hotel
Jie Zhang, Assistant Professor, University of Vermont, United States
Rohit Verma, Professor, Cornell University, United States

We study the evolutionary pattern of resource configuration that supports competitive priorities at the operating unit level. Using archival data from the US hotel industry, we identify clusters with distinct resource configurations contingent on the business cycle and link resource configuration choices with performance. Subsequent experimental analysis supplements the findings.

- 060-0935** P.C.N. and Arena Meet Hotel
Luis Borges, Assistant Professor, Colorado State University Pueblo, United States
Faruq Salawu, Student, Colorado State University Pueblo, United States
Mehmet Ates, Student, Colorado State University Pueblo, United States
Shane Ellis, Student, Colorado State University Pueblo, United States
Kelvin Oseme, Student, Colorado State University Pueblo, United States
Fatih Sentuerk, Student, Colorado State University Pueblo, United States

This paper deals with the analysis of a hotel facility to determine opportunity for improvements using the Process Chain Network (P.C.N.) in combination with the Arena simulation software. The information presented is based on the authors' personal experiences as guests at hotels.

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| 195 | Saturday, 09:45 AM - 11:15 AM, Kalorama | <i>Track: Supply Chain Management</i> |
| | <i>Session: Managing supply chain risks</i> | |
| | <i>Chair(s): Sriram Narayanan</i> | |

- 060-1220** Capability to Respond to Supply Chain Risk Incident: A Grounded Theory Approach
ManMohan Sodhi, Professor, Cass Business School, United Kingdom

To better understand a company's capability to respond to risk incidents, we used Grounded Theory to study how a global pharmaceutical company responded to an international pandemic that impacted its global supply chain owing to surge in demand for vaccines. We used diverse data sources.

- 060-0123** Strategic Debt and Supply Chain Games
Ping Su, Assistant Professor, Hofstra University, United States

Qiaohai (Joice) Hu, Assistant Professor, City University of Hong Kong, United States

We examine the interaction of debt financing and supply chain competition. We find both retailers will adopt strategic debt in equilibrium, but both worse off. Their supplier(s) are better off. When the retailers have a common supplier and only one retailer uses debt, the leveraged one gains the first-move advantage.

060-0608 Friend or Foe: How Buyer-supplier Relationships Respond to Transgressions

Denis Huebner, Student, Swiss Federal Institute of Technology Zurich, Switzerland

Stephan Wagner, Professor, Swiss Federal Institute of Technology Zurich, Switzerland

Christoph Bode, Professor, Universitat Mannheim, Germany

Analyzing a sample of 39 interviews conducted in Europe, Russia, and China we arrive at striking findings regarding relationship inherent resilience towards organizational level conflict. Stemming from (potential) supply chain disruptions as exemplary transgression we identify the antecedents of conflict resilience on organizational level with a set of dyadic relationships.

060-0630 The Tradeoff between Supply Chain Disruptions and Mitigation Costs

Richard Kraude, Student, Michigan State University, United States

Sriram Narayanan, Associate Professor, Michigan State University, United States

Sri Talluri, Professor, Michigan State University, United States

Investing in the wrong supply chain risk mitigation strategies is not only ineffective for reducing the impact of supply chain disruptions, but also increases costs. We contribute to the supply chain risk literature by testing the effectiveness of flexibility versus redundancy mitigation strategies for multiple types of supply chain risks.

196

Saturday, 09:45 AM - 11:15 AM, Jay

Session: Retail Operations 2

Chair(s): Ruomeng Cui

Track: Supply Chain Management

060-0112 Lifting the Veil: The Benefits of Cost Transparency

Bhavya Mohan, Student, Harvard University, United States

Ryan Buell, Professor, Harvard University, United States

Leslie John, Assistant Professor, Harvard University, United States

A firm's costs are typically tightly-guarded secrets. However, across six laboratory experiments and a field study, we identify when and why firms benefit from revealing variable cost information to consumers. Disclosing the variable costs of production heightens consumers' attraction to the retailer, which in turn increases purchase intentions.

060-0169 The Operational Value of Social Media Information

Ruomeng Cui, Assistant Professor, Indiana University Bloomington, United States

Santiago Gallino, Assistant Professor, Dartmouth College, United States

Antonio Moreno-Garcia, Assistant Professor, Northwestern University, United States

Dennis Zhang, Student, Northwestern University, United States

We empirically explore how social media information helps sales forecasting. Using (1) daily sales data from an online apparel startup company that primarily advertises on Facebook, and (2) Facebook posts and the users' comments and likes data, we find a significant improvement in forecasting and inventory cost reduction.

060-0447 The Value of Rapid Delivery in Online Retailing

Santiago Gallino, Assistant Professor, Dartmouth College, United States

Marshall Fisher, Professor, University of Pennsylvania, United States

Joseph Xu, Student, The Wharton School, United States

For online retailers who sell physical goods, every transaction has two main components: the physical product and the services by which the retailer facilitates the customer's purchase. Delivery speed is arguably the most important service component. We use a natural experiment, to assess the impact of faster delivery on revenue.

197

Saturday, 09:45 AM - 11:15 AM, Morgan

Session: Case Studies in Supply Chain Management

Chair(s): Martin Schleper

Track: Supply Chain Management

060-0022 Customer-supplier Proximity – A Case Study in the Automotive Supply Chain

Rosangela Vanalle, Professor, Universidade Nove De Julho, Brazil

Fabio Takeno, Student, Universidade Nove De Julho, Brazil

Wagner Lucato, Professor, Universidade Nove De Julho, Brazil

Literature has shown proximity as a key factor to narrow the relationship between supplier and its customer. Through a case study, this paper explores the factors governing proximity in the Brazilian automotive supply chain. The results showed that strategic reasons were more relevant than cost savings resulting from plant relocation.

060-0136 Supply Chain Due Diligence – An Exploratory Case Study of Adoption of Conflict Mineral Management

Hannes Hofmann, Student, European Business School, Germany

Martin Schleper, Lecturer, EBS University for Business and Law, Germany

Constantin Blome, Professor, University of Sussex, United Kingdom

Recent regulation has set the issue of conflict minerals a top priority for many companies. We investigate the reasons that enable/hinder supply chain due diligence adoption and its impact. We conduct a cross-sectional multi-tier case study approach including OEMs, typical first-tier suppliers (component manufacturers), and second- to third-tier suppliers.

060-1242 Trust Ties in the Supply Chain: A Case Study of Small Business Owners in Brazil

Yahilina Silveira-Pérez, Lecturer, Equinocial Technology University (UTE-Ecuador), Ecuador

Ricardo Martins, Professor, Federal University of Minas Gerais (UFMG), Brazil

This paper examines the way in which entrepreneurs of the furniture industry in Brazil perform their trust in suppliers, customers, competitors and others. The results indicated differences at perception in the constructs associated with opportunism, solidarity and relationship, being customers more reliable than suppliers.

060-0979 Supply Chain Disintegration as a Survival Strategy for Japanese Electronics Companies

Lumbidi Kupanhy, Professor, Wakayama University, Japan

Both in practice and theory, the Japanese model of integrated supply chain (ISC) has in today's globalized business world lost its relevance in the electronics industry. Our research explores and suggests a new and innovative concept of disintegrated supply chain (DSC) for Japanese electronics companies to regain their competitiveness.

198

Saturday, 09:45 AM - 11:15 AM, Northwest

Track: Revenue Management and Pricing

Session: Dynamic Models in Revenue Management

Chair(s): Cong Shi

060-0163 Dynamic Matching Markets with an Application in Residential Real Estate

Costis Maglaras, Professor, Columbia University, United States

Ciamac Moallemi, Associate Professor, Columbia University, United States

Hua Zheng, Student, Columbia University, United States

We study a microstructure model of a dynamic market where buyers and sellers arrive stochastically over time, and are heterogeneous with respect to their product characteristics and preferences and their idiosyncratic financial information. We analyze its dynamics, market depth, and buyer/seller bidding strategies. The motivating application stems from residential real-estate

060-0047 Lifecycle Price and Inventory Optimization in an Omni-channel Environment

Markus Ettl, Manager, IBM, United States

Pavithra Harsha, Research Staff Member, IBM, United States

Shiva Subramanian, Research Staff Member, IBM, United States

Joline Uichanco, Assistant Professor, University of Michigan Ann Arbor, United States

In an omni-channel environment, customers can purchase either from an e-commerce channel or a brick-and-mortar store channel. Inventory is shared across channels due to multiple fulfillment options (e.g. buy online pickup from store). We present a tractable optimization model to determine optimal channel lifecycle prices and inventory allocations.

060-0085 Revenue Management Using Thompson Sampling

Kris Johnson, Student, Massachusetts Institute of Technology, United States

David Simchi-Levi, Professor, Massachusetts Institute of Technology, United States

He Wang, Student, Massachusetts Institute of Technology, United States

We consider the dynamic pricing problem of a retailer facing limited inventory, and the retailer must learn expected demand for each price throughout the season. We use Thompson sampling to develop a dynamic pricing strategy that balances exploration to learn demand and exploitation to maximize revenue.

060-0127 Innovative Dynamic Pricing: The Potential Benefits of Early-purchase Reward Programs

Mike Wei, Assistant Professor, University of Buffalo, United States

Yossi Aviv, Professor, Washington University St Louis, United States

We introduce a very broad class of mechanisms which we refer to as early-purchase reward (EPR) programs to counteract strategic consumer behavior. Such class includes, but is not limited to strategies such as price-matching and price commitment. We provide a complete analytical characterization of the optimal EPR program.

199

Saturday, 09:45 AM - 11:15 AM, Oak Lawn

Track: Operations Management Practice

Session: Mission Critical Operations Planning II

Chair(s): Brian Eck

060-1395 Using Expert Judgments to Determine Yield Distributions for a \$800 Million Decision

Saurabh Bansal, Assistant Professor, Penn State University University Park, United States

Genaro Gutierrez, Associate Professor, University of Texas Austin, United States

We describe a novel approach to obtain yield distributions for new production systems using inputs from experts. We also discuss the implementation of the approach for an agribusiness firm to make a \$800 million annual decision.

- 060-1171** Risk Assessment in a Large Retail Chain
Burak Kazaz, Associate Professor, Syracuse University, United States
John Park, Assistant Professor, Syracuse University, United States
Mert Hakan Hekimoglu, Student, Syracuse University, United States

This study develops a new risk exposure index for various infrastructures in a large retail supply chain. It identifies detrimental disruptions, considers operational and financial metrics with excess capacity at distribution centers and fulfillment centers that can serve as backup facilities. It provides risk levels at all facilities.

- 060-1625** Tactical Factory Planning at Intel Using Mathematical Modeling and Algorithms
Irfan Ovacik, Principal Engineer, Intel Corporation, United States

Master Production Plans need course corrections at execution time to accommodate unexpected events both on the supply and demand side. In this paper, we discuss a set of heuristic and optimization based solutions implemented at Intel's factories to drive tactical decisions to better align supply with the latest demand.

- 060-1545** Improving Productivity and Energy Utilization in Steel Production
Zhi-Long Chen, Professor, University of Maryland, United States
Lixin Tang, Professor, Northeastern University, China
Jiyin Liu, Professor, Loughborough University, United Kingdom

We present a case study where we used optimization algorithms to help make better coil batching decisions in batch annealing operations of a large steel company. We developed a decision support system. We present the decision problem as well the ideas of the algorithms, and highlight the economic benefits achieved.

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| 201 | Saturday, 09:45 AM - 11:15 AM, Parlor A | <i>Track:</i> General Track |
| | <i>Session:</i> Environmental Considerations and Oil-Field Development | |
| | <i>Chair(s):</i> Jessica Elise Soares | |

- 060-0783** Students Knowledge Level of Sustainability Dynamics
Luciana Cezarino, Assistant Professor, Federal University of Uberlândia, Brazil
Etienne Abdala, Assistant Professor, Federal University of Uberlândia, Brazil
Mara Soares, Assistant Professor, Federal University of Uberlândia - UFU, Brazil
Vivian Fernandes, Assistant Professor, Federal University of Uberlândia, Brazil

The paper examines the knowledge level of sustainability dynamics in a Federal Education University in Brazil. A survey with 360 respondents was online conducted within under and graduate students. The results show that students has low knowledge about world affairs but present more knowledge about local sustainable issues.

- 060-0067** The Environmental Law Studies New Regulatory Frameworks for Public Ports in Practice by Sustainable Transport
Washington Luiz Soares, Student, UNISANTOS, Brazil
Getulio Akabane, Retired, CEETEPS, Brazil
Jessica Elise Soares, Student, UNISANTOS, Brazil
Jonathan Soares, Student, UNIMES, Brazil

The environmental law studies new regulatory frameworks for public ports in practice of sustainable transport logistic. The system of Brazilian ports for environmental management depends voluntary actions from operators for developing rules to increase the multimodality consciously. The article links the concept of eco-efficiency with modal shift management models on container transport.

- 060-0053** The Model Pollutant Release and Transfer Register (PRTR) for Quantifying the Gases Emissions and Dangerous Products in Public Ports Areas
Jessica Elise Soares, Student, UNISANTOS, Brazil
Washington Luiz Soares, Student, UNISANTOS, Brazil

The green strategies are required to control international organizations in developing strategies to reduce the environmental impacts. The model Pollutant Release and Transfer Register (PRTR) was developed in this context with aim of quantifying the gases emissions and dangerous pollutant transfers that may affect the environment and the living beings.

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| 202 | Saturday, 09:45 AM - 11:15 AM, Parlor B | <i>Track:</i> Risk Management in Operations |
| | <i>Session:</i> OM-Finance Interface 2 | |
| | <i>Chair(s):</i> Tunay Tunca | |

- 060-0581** Operational Strategies in the Presence of Consumer-driven Bankruptcy Risk
John Birge, Professor, University of Chicago, United States
Rodney Parker, Associate Professor, University of Chicago, United States
Michelle Xiao Wu, Assistant Professor, Washington State University Pullman, United States
S. Alex Yang, Assistant Professor, London Business School, United Kingdom

When strategic consumers sense a firm's financial strength, they may time their purchase by either delaying or advancing it. Such behavior may accelerate the firm's bankruptcy. The firm can respond by selectively using quantity and price, under rational expectations. We illustrate how store credit can be used as a remedy.

060-1533 Valuating Uncertainty in Business-to-Business Pricing: A Case Application of Optimal Learning
Huashuai Qu, Student, University of Maryland, United States
Ilya Ryzhov, Assistant Professor, University of Maryland, United States
Michael Fu, Professor, University of Maryland, United States

We consider business-to-business pricing problems where buyer valuations are uncertain, and the seller's pricing decisions incorporate the dimension of optimal learning. We present a new Bayesian model for quantifying and updating the seller's uncertainty, and show the potential practical benefits in the context of a large real-world pricing dataset.

060-1296 Buyer Intermediation in Supplier Finance
Tunay Tunca, Professor, University of Maryland, United States
Weiming Zhu, Student, University of Maryland, United States

We analyze the role and the efficiency of buyer intermediation in supplier financing (BIF). We theoretically demonstrate that BIF can significantly improve the supply chain surplus over traditional financing. Using data from a large Chinese online retailer, we estimate model parameters, empirically verify the theory, and predict efficiency gains.

060-0393 An Optimization Approach to Collections Risk Management
Sabitha Devarajulu, Student, Indian Institute of Technology Madras, India
Anantha Sundararajan, Assistant Professor, Indian Institute of Technology Madras, India
Rajendran Chandrasekharan, Professor, Indian Institute of Technology Madras, India

We propose an Integer Programming model, followed by a heuristic to detect and quantify consumer delinquency risk. Further, we propose approaches to mitigate this risk and maximize recovery by identifying a robust set of strategies such as optimal pursuit duration, price and time to sell, settlement options, etc.

203	Saturday, 09:45 AM - 11:15 AM, Columbia 5-8	<i>Track:</i> Meetings & Symposiums
	<i>Session:</i> Practice Leaders Semi-Plenary: Operations Challenges and Opportunities 1	
	<i>Chair(s):</i> Christopher Tang	

060-1712 Operations: Challenges and Opportunities from Practitioners' Perspective - 1
ManMohan Sodhi, Professor, Cass Business School, United Kingdom
Nicole DeHoratius, Professor, University of Chicago, United States

This session presents various operational challenges observed by Practitioners in three different industries: healthcare, packaging, and car manufacturing. These challenges create research opportunities for OM researchers.

Saturday, 11:30 AM - 01:00 PM

204

Saturday, 11:30 AM - 01:00 PM, Columbia 1

Track: Behavior in Operations Management

Session: Opportunities in Behavioral Operations: Different Perspectives

Chair(s): Michael Becker-Peth

060-0627 Students and Professionals as Subjects in SCM Experiments: A Comparative Assessment and Recommendations

David Hall, Assistant Professor, Wright State University, United States

Aleda Roth, Professor, Clemson University, United States

Johnny Rungtusanatham, Professor, Ohio State University, United States

This paper subjects to rigorous empirical scrutiny the appropriateness of using students to investigate complex SCM issues in behavioral experiments. We contrast the experimental responses provided by undergraduates, MBAs and experienced professionals. Our results reveal substantive differences among these groups and offer insights into when students are appropriate as subjects.

060-0786 Behavioral Research in Management of Technology

Cheryl Gaimon, Professor, Georgia Institute of Technology, United States

I explore opportunities for behavioral research in management of technology from the initial process for the creation of scientific and technological innovation to the final analysis of organizational performance following product launch. I emphasize the importance of managing knowledge based resource capabilities in dynamic and uncertain global environments.

060-1718 Behavioral Research in Sustainable Operations

Charles Corbett, Professor, University of California Los Angeles, United States

We will discuss opportunities for behavioral research in sustainable operations. The way information about economic, environmental and social trade-offs is presented can have major impacts on the resulting decisions. I will provide some introductory background to this issue but the aim is primarily to have an interactive discussion.

060-1716 Publishing Priority for Behavioral Research in Operations Management: Importance of Replications

Elena Katok, Professor, University of Texas Dallas, United States

I will discuss the current trends and publishing priorities in BOM. An important methodological strength of laboratory experiments is the relative ease of replicating results. I will discuss some thoughts about publishing priorities for studies that replicate, or fail to replicate existing results.

205

Saturday, 11:30 AM - 01:00 PM, Columbia 2

Track: Closed Loop Supply Chains

Session: Panel Discussion: Managing Consumer Returns

Chair(s): Michael Ketzenberg

060-1677 Managing Consumer Returns

Michael Ketzenberg, Associate Professor, Texas A&M University College Station, United States

Necati Ertekin, Student, Texas A&M University College Station, United States

James Abbey, Assistant Professor, Texas A&M University College Station, United States

This panel focuses consumer returns across multiple industries, with particular attention on cross-methodological and cross-disciplinary examinations of the multi-billion dollar impact that returns have on consumer-facing firms. Panelists will present a structural overview of current literature that provides a typological pathway for continued research into consumer returns.

206

Saturday, 11:30 AM - 01:00 PM, Columbia 3

Track: Empirical Research in Operations Management

Session: Studies of Productivity

Chair(s): Bradley Staats

060-0455 The Productivity of Not Working: Learning from Reflection

Brad Staats, Professor, University of North Carolina Chapel Hill, United States

Research on learning has primarily focused on the role of doing. Drawing on literature in psychology and neurosciences, we propose that a critical component of learning is reflection. We explain the boost in learning from reflection through the mechanism of self-efficacy. We test the model using field and lab experiments.

060-0609 When Speed Equals Wait: ☐ The Impact of a Reduction in ED US Order Processing Time ☐

Jillian Berry Jaeker, Assistant Professor, Boston University, United States

Michael Lee, Emergency Department Attending, Lifespan, United States

Anita Tucker, Associate Professor, Harvard University, United States

We examine the impact of an exogenous change on ultrasound (US) use in two EDs using a difference-in-differences model. We find that when US are easier to order, more are ordered, which increases the LOS of all ED patients, not just those receiving US.

060-1049 Collaboration and Professional Labor Productivity: An Empirical Study of Physician Workflows in a Hospital

Lu Wang, Student, Kellogg School of Management, United States

Itai Gurvich, Associate Professor, Kellogg School of Management, United States

Jan van Mieghem, Professor, Kellogg School of Management, United States

Kevin O'Leary, Associate Professor, Medicine-Hospital Medicine, United States

We study the impact of physicians' collaboration activities on their productivity induced by synchronization. With data collected by shadowing hospitalists, we show that the switching behavior inherent in collaboration can lead to a 39% capacity loss. We disentangle the benefit and cost of switches and identify 8.6% avoidable loss.

- 060-0715** Impact of Operational Failures on Productivity: Evidence from Agribusiness Setting
Pradeep Pendem, Student, University of North Carolina Chapel Hill, United States
Brad Staats, Professor, University of North Carolina Chapel Hill, United States
Francesca Gino, Professor, Harvard University, United States

Failures in operations play important role in worker performance. We find productivity follows inverted U shaped response to failure by breaks. Failures due to disruptions, have negative impact on productivity. In addition, these effects are exacerbated by employee workload. Our findings show minimizing failures may not always right approach to achieve efficient performance.

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| 207 | Saturday, 11:30 AM - 01:00 PM, Columbia 4 | Track: Retail Operations Management |
| | Session: Decisions in Retail Operations | |
| | Chair(s): Olga Perdikaki | |

- 060-0118** Allocation of Decision Rights in Retail Supply Chains
Qingning Cao, Student, Vanderbilt University, United States
Mumin Kurtulus, Assistant Professor, Vanderbilt University, United States
Sezer Ulku, Associate Professor, Georgetown University, United States

Our paper studies the implications of allocating decision rights (retail assortment, inventory ownership) in a supply chain. In particular, we identify product and market characteristics that lead to a win-win situation for the manufacturer and the retailer, when the manufacturer assumes both the assortment and inventory responsibilities.

- 060-0121** Price/ Promotion/ Display Effects on Demand
Mariana Nicolae, Assistant Professor, Eastern Michigan University, United States
Mark Ferguson, Professor, University of South Carolina, United States
Olga Pak, Student, University of South Carolina, United States

Most consumer goods companies plan their price, promotion and display campaigns based on aggregate sales data. In joint work with Oracle Retail, we estimate choice models on retail transaction data across multiple market and store locations to identify the influence of price, promotion and display effects.

- 060-0380** Execution Quality: An Analysis of Fulfillment Errors in a Retail Distribution Center
Nathan Craig, Assistant Professor, Ohio State University, United States
Nicole DeHoratius, Professor, University of Chicago, United States
Diego Klabjan, Associate Professor, Northwestern University, United States
Yan Jiang, Manager, Marketing Analytics, Sears Holdings Corporation, United States

Purchase orders specify many aspects of fulfillment, including bar coding, carton labeling, retail ticketing, and others. These terms are instrumental for supply chains employing automation and techniques like pack-by-store. We examine the prevalence and cost of violations of these terms in practice using data collected from a major retailer.

- 060-0815** Optimal Replenishment in Vendor Managed Inventory Systems Using Point-of-Sales Data
Achal Bassamboo, Associate Professor, Northwestern University, United States
Antonio Moreno-Garcia, Assistant Professor, Northwestern University, United States
Ioannis Stamatopoulos, Student, Northwestern University, United States

Inventory management in vendor managed inventory (VMI) systems is particularly challenging, as, in addition to demand uncertainty, suppliers face inventory record inaccuracy (IRI). We show that although the optimal inventory policy for this setting is complex, there exists a simple, intuitive policy that performs close to optimally.

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| 209 | Saturday, 11:30 AM - 01:00 PM, Columbia 10 | Track: Sustainable Operations |
| | Session: Sustainable supply chain management: Operational concerns | |
| | Chair(s): Eda Kemahlioglu-Ziya | |

- 060-0370** 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
Asoo Vakharia, Professor, University of Florida, United States

Our paper studies the problem of legislation practices on who should be responsible for recycling, and compares the existing mechanisms on the efficiency of environmental protection. Given different social objectives, we aim to provide roadmap to the social planner on legislation for remanufacturing and recycling activities.

- 060-0482** Optimal Design of Collection Networks for Electronics Take-back Legislation
Hadi Gashti, Student, North Carolina State University, United States
Megan Jaunich, Student, North Carolina State University, United States

Joe DeCarolis, Assistant Professor, North Carolina State University, United States
Robert Handfield, Professor, North Carolina State University, United States
Eda Kemahlioglu-Ziya, Assistant Professor, North Carolina State University, United States
Ranji Ranjithan, Professor, North Carolina State University, United States

We develop a mathematical model to determine the optimal configuration for a collection and processing network to comply with take-back legislation. We consider both cost and carbon footprint minimization as objectives. We aim to identify how the optimal network design changes as the objective changes.

060-0485 Manufacturers' Recycling Strategies: Competition and Cooperation in Sustainability

Fang Tian, Student, University of Southern California, United States
Greys Susic, Associate Professor, University of Southern California, United States
Laurens Debo, Associate Professor, University of Chicago, United States

This paper discusses recycling of two types of products with different brands. We identify economies of scale, product heterogeneity, and market competition as factors that determine the recycling structure. Especially, under intense market competition, if manufacturers are asymmetric, products with the same brand may be recycled together.

060-0600 A Voluntary Emission Reduction Choice of Manufacturer Considering Consumer's Low-carbon Preference

Yanju Zhou, Professor, Central South University, China
Caihua Yuan, Student, Central South University, China

We build a game model containing consumers' low-carbon preference, carbon emission permit's price and free carbon quotas to study whether a not forced manufacturer will or not participate in emission reduction voluntarily, and obtained the market conditions a voluntary company needs and some conclusions about unit product's real carbon emission.

210

Saturday, 11:30 AM - 01:00 PM, Columbia 11

Track: Sustainable Operations

Session: Empirical Research on Sustainability and Profitability

Chair(s): Brian Jacobs

060-0509 Are Corporate Social Responsibility and Marketing Capability Complementary? A Shareholder Wealth Perspective

Sachin Modi, Associate Professor, University of Toledo, United States
Saurabh Mishra, Associate Professor, McGill University, Canada

Existing research linking corporate social responsibility (CSR) and financial performance presents equivocal evidence. This paper proposes that the effect of CSR on financial performance may be contingent on the firm's marketing capability. Analysis utilizing information for a large sample of firms across 2000-2009 reveals novel research and managerial implications.

060-0421 How Does the Supplier-customer Link Affect Carbon Performance?

Chien-Ming Chen, Assistant Professor, Nanyang Business School, Singapore
Maria Montes-Sancho, Associate Professor, University of Carlos III Madrid, Spain

This paper empirically tests the mechanisms through which a firm's carbon performance might be associated with its customers'. We posit that this association exists and its strength is moderated by customers' sales contribution and customers' own market power in their respective output markets.

060-1175 The Relationship Between Sustainability, Productivity and Performance

Richard Kraude, Student, Michigan State University, United States
Brian Jacobs, Assistant Professor, Michigan State University, United States
Sriram Narayanan, Associate Professor, Michigan State University, United States

Reviewing the literature on sustainable operations suggests a more complex relationship may exist than has been tested previously between the key elements of sustainability and manufacturing efficiency. We empirically test the relationship between Corporate Social Responsibility and firm-level productivity.

060-1415 Financial Performance of LEED Certification in Hospitality Industry

Matthew Walsman, Student, Cornell University, United States
Suresh Muthulingam, Assistant Professor, Penn State University State College, United States
Rohit Verma, Professor, Cornell University, United States

This paper presents the results of an event study using a multi-level longitudinal model (HLM) to measure the impact of sustainable initiatives (i.e. LEED certification) on financial performance in the US hospitality industry. We find that certification does contribute to higher revenue for the certifying hotel, relative to its competitors.

211

Saturday, 11:30 AM - 01:00 PM, Columbia 12

Track: Global Operational Issues

Session: Demand Management Strategies

Chair(s): Yongbo Xiao

060-0397 Exchange-Old-for-New Program: An Incentive to Induce Early Purchases with Product Rollover

Yongbo Xiao, Associate Professor, Tsinghua University, China
Qian Liu, Associate Professor, Hong Kong University of Science & Tech, Hong Kong

To motivate customers to make early purchase in presence of product roll-overs, we propose to adopt an exchange-old-for-new program in which the manufacturer offers to upgrade the old products to a new version in a future time. By considering strategic customers, we study the optimal dynamic pricing decision.

060-0684 Duopolistic Procurement Contracts with Horizontal Information Asymmetry

He Huang, Professor, Chongqing University, China

Hongyan Xu, Associate Professor, Chongqing University, China

This paper examines procurement contract design and horizontal information sharing in a supply chain competition scenario where supplier of each chain obtains one dimension of private information and manufacturer could share another dimension of private information with its competitor. We investigate the interplay of horizontal information asymmetry and vertical asymmetry.

060-0770 Group-buying Strategy with Two Suppliers

Lei Guan, Assistant Professor, School of Management and Economics, China

We consider an environment with two suppliers, in which one uses group-buying price mechanism, and the other uses flat price. Retailers' ordering choice is discussed, and we also study how the supplier should set the GBP price curve. The supplier should not use a small slope price curve under GBP.

060-0984 Optimal Prices for Competing Firms Considering Trade-in Rebates and Secondary Market

Peng Wu, Associate Professor, Sichuan University, China

Trade-in decisions are often observed in many industries and have a significant impact on competition equilibrium and profits. This paper derives the demand function from consumers' utility and choice, and then optimizes the pricing decision and trade-in decision based on the derived demand functions and revenue from a secondary market.

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Saturday, 11:30 AM - 01:00 PM, Piscataway

Track: Inventory Management

Session: Topics on Inventory and supply chain management

Chair(s): Min Wang

060-0371 On the Determination of Optimal Ordering Policies for Blood Products with Blood Transfers

Karti Puranam, Assistant Professor, La Salle University, United States

David Novak, Associate Professor, University of Vermont, United States

Marilyn Lucas, Associate Professor, University of Vermont, United States

We investigate the determination of optimal order policies for blood products when blood transfers exist from other hospitals. We develop an analytical model to propose simple decision rules and compare these rules to existing policies - relying on real-world data from the Blood Bank of a local hospital.

060-0399 Joint Exchange and Stocking Policies for Repairables

Shimon Bitton, Student, Technion Israel Institute of Technology, Israel

Izack Cohen, Assistant Professor, Technion Israel Institute of Technology, Israel

Morris Cohen, Professor, University of Pennsylvania, United States

We consider 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. We use Erlang queueing models for developing stocking and repair policies.

060-1145 An Inventory System with Multiple Demand Classes

Min Wang, Assistant Professor, Drexel University, United States

We consider a single-product inventory system with multiple demand classes. Inventories are replenished using a (Q, R) policy and are rationed among demand classes according to a nested threshold-level policy. We establish structural results for the key performance measures and develop an efficient algorithm for computing the policy parameters.

060-1514 Effects of Downstream Entry in a Supply Chain with Spot Market

Xuan Zhao, Associate Professor, Wilfrid Laurier University, Canada

This paper investigates the effect of downstream entry on a two-echelon supply chain with risk-averse players in the presence of a spot market. We find that the manufacturers consider three factors in deciding contract procurement quantities: production, demand-hedging and speculation.

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Saturday, 11:30 AM - 01:00 PM, Cardozo

Track: Information in Operations Management

Session: Panel Discussion

Chair(s): Vijay Mookerjee

060-1653 Panel Discussion: Operations Management and Information System Interface

Vijay Mookerjee, Professor, University of Texas Dallas, United States

Asoo Vakharia, Professor, University of Florida, United States

Subodha Kumar, Professor, Texas A&M University College Station, United States

Karthik Kannan, Associate Professor, Purdue University, United States

Geoffrey Parker, Professor, Tulane University, United States

Janice Carrillo, Associate Professor, University of Florida, United States

This panel will discuss the research and publication ideas in Operations Management and Information System Interface.

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Saturday, 11:30 AM - 01:00 PM, Du Pont

Track: Humanitarian and Not-for-profit Operations

Session: Humanitarian Logistics for Disaster Response

Chair(s): Begona Vitoriano Pamela Nolz

060-0598 Logistics Preparedness in Humanitarian Operations

Marianne Jahre, Professor, BI Norwegian Business School, Norway

Ala Pazirandeh, Assistant Professor, Gothenburg University, Sweden

Luk van Wassenhove, Professor, INSEAD, France

The humanitarian community calls for better logistics preparedness. Prevailing understanding, however, is fragmented with little information from organizations and a limited research focus mainly on prepositioning. Based on secondary and primary data, the study's purpose is to develop a preparedness framework focusing on what is needed for efficient mobilization.

060-0577 Choice Based Allocation for Disaster Relief Logistics

Pamela Nolz, Scientist, AIT Austrian Institute of Technology, Austria

Christian Burkart, Student, Vienna Univ of Econ & Business Admin, Austria

Walter Gutjahr, Professor, University of Vienna, Austria

After a natural disaster relief items are to be transported from a central depot to distribution centers, where they are handed out to the population in need. We present a multi-objective optimization problem encompassing two objective functions: (i) minimization of total uncovered demand and (ii) minimization of total distribution costs.

060-0832 Humanitarian Logistics in the Ebola Response

Tina Comes, Associate Professor, University of Agder, Norway

Bartel van de Walle, Associate Professor, Tilburg University, Netherlands

The Ebola outbreak in West Africa goes beyond the typical response patterns for natural vs. sudden onset disasters. We will present results from field research conducted in December 2014 in Accra/Ghana and report on the logistics challenges related to information sharing and coordination; access; volatile demand patterns; specific medical requirements.

060-1123 An Heuristic Approach for a Multi-criteria Humanitarian Aid Distribution Problem

M. Teresa Ortuno, Associate Professor, Universidad Complutense De Madrid, Spain

Jose Maria Ferrer, Assistant Professor, Universidad Complutense de Madrid, Spain

Gregorio Tirado, Lecturer, Universidad Complutense De Madrid, Spain

Begona Vitoriano, Associate Professor, Universidad Complutense De Madrid, Spain

Planning the delivery of humanitarian aid involves considering different factors other than cost, which lead to a complex multi-criteria optimization problem. In this work a constructive algorithm and a metaheuristic inspired on a GRASP (Greedy Randomized Adaptive Local Search Procedure) methodology are presented to solve this problem.

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Saturday, 11:30 AM - 01:00 PM, Embassy

Track: Product Innovation and Technology Management

Session: Innovation in Services

Chair(s): Ioannis Bellos

060-0218 Technology Convergence in Healthcare Innovation

Mark Phillips, Student, University of Cambridge, United Kingdom

Convergent technologies have the potential to address some of healthcare's challenges. These bring new complexities to product development requiring integration of ecosystem and business model requirements into the innovation process. This case study research takes an integrative approach to investigate innovation and the required business model and value network capabilities

060-0846 Sustainable Product and Process Innovations with the Opportunity of Licensing and the Threat of Imitation

Jenyi Chen, Assistant Professor, Cleveland State University, United States

Stan Dimitrov, Assistant Professor, University of Waterloo, Canada

We consider a sustainable manufacturer making investment decisions on product and process innovations in the presence of a traditional manufacturer who may license or imitate innovation. We characterize the equilibrium outcomes of the noncooperative game and show that the innovator may make strategic investments to preempt the imitator.

060-1620 Product Innovation Contest on Service Network: Competitive Spillover from Exclusive Dealing

Hyunwoo Park, Student, Georgia Institute of Technology, United States

Rahul Basole, Associate Professor, Georgia Institute of Technology, United States

We study how exclusive contract can be leveraged to induce supply-side competition on product innovation. This study uses the difference in differences method to estimate the impact of iPhone to other manufacturers' supply behavior. Over and after exclusive contract, other device manufacturers supplied their better phones to AT&T.

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Saturday, 11:30 AM - 01:00 PM, Fairchild East

Track: Healthcare Operations Management*Session:* Stochastic models in patient flow management*Chair(s):* Mor Armony Pengyi Shi

- 060-0652** Improving the Prediction of Emergency Department Waiting Times
Erjie Ang, Student, Stanford University, United States
Michael Aratow, Doctor, San Mateo Medical Center, United States
Mohsen Bayati, Assistant Professor, Stanford University, United States
Sara Kwasnick, Student, Stanford University, United States
Erica Plambeck, Professor, Stanford University, United States

We develop a new method for forecasting Emergency Department wait times. The method combines fluid model estimators and statistical learning, and is significantly more accurate than existing approaches to ED wait time forecasting. We validate the method on historical and post-implementation data from four hospitals.

- 060-1250** Overflow Policies for Emergency Department Patients Awaiting Inpatient Beds
Pengyi Shi, Assistant Professor, Purdue University, United States
Jim Dai, Professor, Cornell University, United States

ED patients awaiting to be admitted to inpatient wards sometimes have to be overflowed to a non-primary ward when they wait too long. Overflow may alleviate the system congestion temporarily, but could reduce the quality of care. We study a queueing system to examine the impact of different overflow policies.

- 060-1399** Critical Care in Hospitals: When to Introduce a Step Down Unit?
Mor Armony, Associate Professor, New York University, United States
Carri Chan, Assistant Professor, Columbia University, United States

Step Down Units (SDUs) provide an intermediate level of care between ICUs and medical wards. An SDU alleviates ICU congestion, but it also reduces ICU capacity. We find that, depending on system parameters, the optimal size of the SDU may be zero or comparable in size to the ICU.

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Saturday, 11:30 AM - 01:00 PM, Fairchild West

Track: Healthcare Operations Management*Session:* Chronic disease management and proactive prevention*Chair(s):* Aurelie Thiele

- 060-0366** Impact of Mobile Health Monitoring for Diabetes and Hypertension on Patient Care
Anu Banerjee, Student, Binghamton University, United States
Saligrama Agnihotri, Professor, Binghamton University, United States
Seth Spain, Assistant Professor, Binghamton University, United States

Mobile health (M-health) helps healthcare providers to monitor their patients remotely using mobile devices and adjust patient care plan dynamically. We provide an overview of M-health and consider an M-health application to monitor and control diabetes and hypertension. We present preliminary results of patient data analysis.

- 060-0404** How Would a Proactive Supply Chain Alignment Prevent Diabetes (Diabetes and Obesity)
Balan Sundarakani, Associate Professor, University of Wollongong In Dubai, United Arab Emirates

This research aims to investigate the underlying health-economic factors contributing to preventing and treating diabetes in United Arab Emirates. The research in particular examines the proactive and reactive supply chain alignment and execution practices to reduce the prevalence of the diabetes.

- 060-1393** Population Health and Operations Management: Trends and Research Directions
Vicki Smith-Daniels, Professor, Indiana University, United States

Population Health proactively applies strategies and interventions to defined groups of individuals across the continuum of care to improve the health of the individuals within the group at the lowest necessary cost. This presentation identifies high impact research areas for operations management researchers in the area of population health management.

- 060-1292** The Effect of Patient Navigator Activities and Case Complexity on Diabetes Outcomes
Wiljeana Glover, Assistant Professor, Babson College, United States

This study examines the effectiveness of a diabetes patient navigator program. With 221 participants over 6-12 months, we found statistically significant reductions in the mean A1C by 0.6%, inpatient (IP) visits by 49%, and emergency department (ED) visits by 33%. Increased case complexity was associated with lower ED visit rates.

- 060-0934** Robust Strategic Decisions for the Fully Diversified Disease Management Model
Aurelie Thiele, Associate Professor, Massachusetts Institute of Technology, United States
Shuyi Wang, Student, Lehigh University, United States

We provide a quantitative model to help pharmaceutical companies determine the optimal strategy under high uncertainty for each segment of a J&J-like business model called the Fully Diversified Disease Management Model, which includes health management, diagnostics&devices, and medication, and incentivizes patients' health. We apply this to chronic disease management.

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Saturday, 11:30 AM - 01:00 PM, Gunston East

Track: Manufacturing Operations*Session:* Design and Performance*Chair(s):* Sung Woo Byun

- 060-0418** The Modularity-performance Link: A Contingency Perspective
Malte Brettel, Professor, RWTH Aachen University, Germany
Niklas Friederichsen, Student, RWTH Aachen University, Germany

Modularity is known to have a positive influence on several operational performance dimensions. Still, empirical results on the effects of modularity are contradictory. We elaborate on the development of empirical findings by systematically charting the available literature and derive a contingency framework for the research stream of modularity.

- 060-1340** Adaptability as Competitiveness Mean for Small Manufacturers and Latin American Entrepreneurs
Cesar Ortega, Student, Universidad Nacional Autónoma de Honduras, Honduras
Jesus Argueta, Professor, National Autonomous University of Honduras (UNAH), Honduras
Taria Andino Ruiz, Student, National Autonomous University of Honduras (UNAH), Honduras

This article analyses the theoretical background of the adaptability concept, applied across the manufacturing ambience, seen as a critical ingredient in the long-term small manufacturer's strategies, which represents a challenge for this industry due to the dynamic environment in which they are living. From here the origin of studying how easy it is for a small manufacturer to adapt the genesis of a product locally, and determine how this industry makes adjustments according to their own expectations in terms of innovation, cost, products, services among others. And so the same how it responds to its market and its social environment.

- 060-0248** The Influence of Performance Objectives on the Implementation of Lean Manufacturing Practices
Hamilton Pozo, Retired, Centro Paula Souza, Brazil
Orlando da Silva, Associate Professor, Universidade Metropolitana Unidas, Brazil
Getulio Akabane, Retired, CEETEPS, Brazil

This paper explores how the choices about, and implementation of, lean production practices are influenced by performance goals prioritized by firms in the context of operations strategy. We analyzed a set of fifty-six companies (divided into four strategic groups) in the auto parts industry with good results.

- 060-0968** Product-process Matrix Revisited: Case Studies on Process Industries
Sung Woo Byun, Lecturer, Manufacturing Management Research Center, Japan
Junichi Tomita, Associate Professor, Toyo University, Japan
Masamichi Ogami, Assistant Professor, Graduate School of Economics, Nagoya City University, Japan

The purpose of this study is to elaborate on the distinguishing characteristics of process industry manufacturing through case studies on steel, glass and beer industry. We will discuss the limits of 'product-process matrix' framework on process industries and will suggest useful framework.

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Saturday, 11:30 AM - 01:00 PM, Gunston West

Track: Marketing and OM Interface*Session:* Applications in the Marketing OM Interface*Chair(s):* Xiaodan Pan

- 060-0563** Segmentation Strategy with High Collectivistic Culture Context: An Application to Nanostores in Bogota
Xiaodan Pan, Student, University of Maryland, United States
Tony Craig, Assistant Professor, Iowa State University, United States
Edgar Blanco, Professor, Massachusetts Institute of Technology, United States

Product diffusion is the key foundation to increase purchase intention in the nanostore market with high collectivistic culture context. Using sample sales data from over 30,000 nanostores in Bogota, Colombia, this study demonstrates an exploratory method analyzing how to apply segmentation strategy, a diffusion value matrix, in product category assortment.

- 060-1309** Franchising: A Choice of Entrepreneurship in the Honduran Fast Food Industry
Taria Andino Ruiz, Student, National Autonomous University of Honduras (UNAH), Honduras
Jesus Argueta, Professor, National Autonomous University of Honduras (UNAH), Honduras

The manner at which the fast-food industry progresses in a still unchecked worldwide pattern, requires rigorous, extreme and reasonable strategies that aid the investors visualize a safer business scenario, parting from the above, it is of great importance to consider the use of the franchising process as an alternative for companies to aim for sustainability, growth and expansion. For this reason this study aims to demonstrate that the process of franchising can boost competitiveness in a significant manner over the fast-food industries allocated in the city of Tegucigalpa, Honduras and thereby unveil the advantages and disadvantages of the method.

- 060-1063** The Impact of Market Orientation and Delivery Capability: A Multi-group Analysis
Suntichai Kotcharin, Assistant Professor, Thammasat Business School, Thailand

The paper investigates the impact of market orientation on delivery and tests the moderating effect of firm size on the relationship between market orientation and delivery. The samples were drawn from Thailand's automotive industry and a multi-group analysis in structural equation modeling was used to analyze the propose model.

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Saturday, 11:30 AM - 01:00 PM, Coats
Session: Bargaining in operations management
Chair(s): Kyle Hyndman

Track: Economics Models of Operations

060-0174 Procurement in the Presence of Supply Disruptions

Elena Katok, Professor, University of Texas Dallas, United States
Lijia Tan, Student, Wang Yanan Institute for Studies in Economics (WISE), China

We report on a set of laboratory experiments in a setting with possible supply disruptions. We find that long term relationships, the ability to renegotiate, and the ability to have free form communication, all increase channel efficiency.

060-0300 Bargaining and the Allocation of Risk in Supply Chains: An Experimental Study

Andrew Davis, Assistant Professor, Cornell University, United States
Kyle Hyndman, Assistant Professor, University of Texas Dallas, United States

We conduct an experiment where a retailer and a supplier negotiate a wholesale price contract that specifies a wholesale price, order quantity and inventory location. Regardless of risk preferences, most subjects try to push risk on the other party. We also show that unstructured bargaining increases channel efficiency.

060-0810 Discrete Rule Learning in First Price Auctions

Jason Shachat, Professor, Durham University, United Kingdom
Lijia Wei, Associate Professor, Wuhan University, China

We present a hidden Markov bidding model for first price auctions. The latent strategy space consists of two pricing rule of thumbs, absolute and percentage mark-up, and a strategic bidding rule. Transitions between rules is driven by myopic reinforcement learning. We estimate the model using a new laboratory experiment.

060-1149 Reputation Building and Conflict Resolution in Online Markets

Gary Bolton, Professor, University of Texas Dallas, United States
Ben Greiner, Professor, University of New South Wales, Australia
Axel Ockenfels, Professor, University of Cologne, Germany

Many online markets encourage traders to make good on an unsatisfactory trade by offering the opportunity to withdraw negative reputational feedback in a conflict resolution phase. Field evidence and theoretical considerations suggests this can distort trade terms and initial feedback. We study these issue in laboratory online markets.

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Saturday, 11:30 AM - 01:00 PM, Monroe
Session: Managing the Antecedents of New Product Development Performance
Chair(s): Debasish Mallick

Track: Product Innovation and Technology Management

060-0091 Barriers in Adoption of Advanced Technologies

Jasna Prester, Associate Professor, University of Zagreb, Croatia
Petra Jung Erceg, Lecturer, Fraunhofer Institute for Systems and Inn, Germany

Advanced technologies are crucial for the future of European manufacturing. They can be used for improving products and for improving production process. In order to identify the level and barriers of adoption of these advanced technologies, a survey research and a workshop was conducted in Croatia.

060-0559 Achieving Sustainability through Business Model Change: Contingencies for the Optimal Timing

Anton Shevchenko, Student, York University, Canada
Moren Levesque, Professor, York University, Canada
Mark Pagell, Professor, University College Dublin, Ireland

A gap exists between theories suggesting that sustainability will only occur once firms take entrepreneurial action to change their business models and practices that focus on reducing the negative impact of existing unsustainable operations. This paper explores contingencies needed to refocus firms on adopting sustainable business models.

060-1142 The Impact of Design Debugging on New Product Development Speed

Alex Alblas, Assistant Professor, Eindhoven University of Technology, Netherlands
Fred Langerak, Professor, Technische Universiteit Eindhoven, Netherlands

In the past two decades a number of researchers have sought to determine the drivers of NPD cycle time. Debate continues about the best strategies for cycle time management in different contexts. In this paper we investigate the impact of production ramp-up design iteration practices on NPD speed.

060-0023 Impact of Development Tools on New Product Development Performance

Debasish Mallick, Associate Professor, University of St. Thomas, United States

We empirically examine the direct and indirect impact of a wide range of popular new product development tools on product development performance with a large multi-industry, multi-country dataset.

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Saturday, 11:30 AM - 01:00 PM, Holmead East
Session: Strategic interactions in service systems
Chair(s): Eren Cil

Track: Service Operations**060-0405** Pricing and Capacity Allocation for Shared Services

Vasiliki Kostami, Assistant Professor, London Business School, United Kingdom
Dimitris Kostamis, Assistant Professor, University of North Carolina Chapel Hill, United States
Serhan Ziya, Associate Professor, University of North Carolina, United States

We study the pricing and capacity allocation problem of a service provider who serves two distinct customer classes with different willingness to pay for service, and utilities that are affected by the presence of other customers in the system under four scenarios associated with the provider's flexibility.

060-0983 The Joint Impact of Product Design and Sourcing Decisions on Supply Chains

Mohsen Jafari Songhori, Student, Singapore University of Technology and Design, Singapore
Shu-Jung Sunny Yang, Assistant Professor, University of Southampton, United Kingdom
Alan Smith, Senior Lecturer, University of Melbourne, Australia

Product design decisions not only affect the cost and revenue drivers for firms but also impact the outcome of their sourcing decisions. We analyze the design and sourcing decisions of firms in a supply chain at the same time: the former is the extent to which a product is modular versus integral, and the latter is to source key components to either specialist suppliers or generalist suppliers. Besides, our game-theoretic model considers two distinctive segments of consumers: high-valuation and low-valuation. There are twelve possible supply chain configurations in our model setting. Some of implications of our analysis are not readily apparent and contrary to the intuition. For instance, our analytical finding suggests that when a component is made common (more modular product) and sourcing to generalist supplier, the average quality of the products offered the two segments as well as the supply chain performance decrease. We conclude that matching design and sourcing decisions play a key role in determining the optimality of supply chain configuration.

060-1510 Staffing Service Systems When Capacity Has a Mind of Its Own

Itai Gurvich, Associate Professor, Northwestern University, United States
Martin Lariviere, Professor, Northwestern University, United States
Antonio Moreno-Garcia, Assistant Professor, Northwestern University, United States

We study service systems in which workers determine their own schedules and examine how a firm recruits agents and sets compensation to generate sufficient agent participation to meet a desired service level. We show that allowing self scheduling leads to non-conventional cost structures and can be costly.

060-0516 Observational Learning in Congested Multi-location Environments: Theory and Experiment

Chen Jin, Student, Northwestern University, United States
Laurens Debo, Associate Professor, University of Chicago, United States
Mirko Kremer, Professor, Frankfurt School of Finance & Management, Germany
Seyed Iravani, Professor, Northwestern University, United States

We study human choice behavior in a congested multi-location system with quality variation among locations and information asymmetry among sequentially arrived customers, i.e. some customers are informed and know the quality of all locations while others don't (uninformed). Customers all observe the queue length at each location upon arrival.

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Saturday, 11:30 AM - 01:00 PM, Holmead West
Session: Service Management in the Airline Industry
Chair(s): Amitkumar Kakkad

Track: Service Operations**060-0910** The Impact of Service Failures on Airline Profitability: A Neural Network Approach

Mahour Parast, Assistant Professor, University of North Carolina, United States
Davood Golmohammadi, Associate Professor, University of Massachusetts Boston, United States
Kathleen McFadden, Professor, Northern Illinois University, United States

This paper uses longitudinal data from the US airline industry to investigate the impact of various service failures on financial performance between firms pursuing different business strategies. Service failures examined in this study include airline flight delays, mishandled baggage, involuntary denied boarding, and customer complaints. Neural network modeling is employed to address the research questions.

060-0837 Service Recovery When the Firm Has Not Failed to Deliver

Amitkumar Kakkad, Assistant Professor, University of San Diego, United States

This paper reviews the extant literature on service recovery, and proposes a framework for a distinct category of service failures that the current literature does not address adequately: recovering from service failures when it is not the firm that has not failed to deliver.

060-1077 Enhancing Airport Passenger's Service through Terminal Flow Management

Youngjin Kim, Student, Seoul National University, Korea, Republic of (South Korea)
Younggil Kim, Student, Seoul National University, Korea, Republic of (South Korea)
Soo Wook Kim, Professor, Seoul National University, Korea, Republic of (South Korea)

This paper develops and implements an analytical queueing model for an aircraft departure passenger. The model is formulated using data collected at Incheon International Airport. This model and analytical results yield useful insights for airport capacity estimation and resource allocation for security and immigration.

Saturday, 11:30 AM - 01:00 PM

- 060-1440** Scheduling Airline Flights through a Selfish Mega Hub
Sufian Ikhmeis, Student, New Jersey Inst of Technology, United States
Sanchoy Das, Professor, New Jersey Inst of Technology, United States

Single mega-hub airline networks with a significantly different operating structure are studied. These are located primarily in the Middle East and operate a continuous flow model. Here we present a new cost function and present a descriptive model to capture the cost behavior of these networks.

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| 224 | Saturday, 11:30 AM - 01:00 PM, Kalorama | Track: Supply Chain Management |
| | Session: Government Policies and Supply Chains | |
| | Chair(s): Wenqiang Xiao Terry Taylor | |

- 060-0450** Worst-case Performance Guarantees for Uniform Co-payments
Retsef Levi, Professor, Massachusetts Institute of Technology, United States
Georgia Perakis, Professor, Massachusetts Institute of Technology, United States
Gonzalo Romero, Assistant Professor, University of Toronto, Canada

We analyze the problem of a central planner allocating co-payment subsidies to competing heterogeneous firms, under an endogenous market response and a budget constraint. We present the first worst-case performance guarantees in maximizing market consumption for the frequently implemented policy of uniform co-payments, where every firm receives the same co-payment.

- 060-0545** The Role of Government Subsidies upon the Adoption of Energy Efficient Products
Haoying Sun, Assistant Professor, Texas A&M University College Station, United States
Stephen Gilbert, Professor, University of Texas Austin, United States

We adopt a durable goods framework to examine how the timing of the government subsidies for purchasing products with enhanced energy efficiency affects the manufacturer's production and investment decisions and how this in turn affects the energy consumption.

- 060-1377** Feed-in Tariff versus Rebate for Renewable Generation
Ruben Lobel, Assistant Professor, University of Pennsylvania, United States
Volodymyr Babich, Associate Professor, Georgetown University, United States

We compare two types of subsidies used to stimulate renewable energy generation: a feed-in tariff and an upfront rebate. The former guarantees a steady cash flow over the long term, while the latter reduces the upfront capital requirement. We show how uncertainty and financing costs determines policy efficiency.

- 060-1658** Donor Product-subsidies to Increase Consumption
Terry Taylor, Associate Professor, University of California Berkeley, United States
Wenqiang Xiao, Associate Professor, New York University, United States

Implications of Consumer Awareness and Profit-Maximizing Intermediaries: This paper studies how a donor's loss of price control and the level of consumer awareness influence the donor's optimal subsidy and utility.

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| 225 | Saturday, 11:30 AM - 01:00 PM, Jay | Track: Scheduling and Logistics |
| | Session: Applications in Scheduling | |
| | Chair(s): Roger Solano | |

- 060-0504** Sequencing in Multi-item Auctions
Selcuk Karabati, Professor, Koc University, Turkey
Cem Ozturk, Assistant Professor, Georgia Institute of Technology, United States

We consider the sequencing problem in multi-item auctions, and develop a mathematical model of the problem when all information is public. We present an analysis of sequencing strategies that rely only on items' market values over a set of problems generated using a data set of a car auction house.

- 060-0049** ATM Replenishment Scheduling
Yu Zhang, Student, University of North Carolina Chapel Hill, United States

We consider an ATM replenishment problem where the bank operates multiple ATMs and empty ATM incurs loss of good will. The replenishment cost is a non-linear function. We present structures of the optimal strategy and study a heuristic policy which is easy to implement.

- 060-0205** Using Automatic Vehicle Location to Improve Bus Schedule Reliability in a Rural Transit System
Roger Solano, Associate Professor, Slippery Rock University, United States
Xindi Li, Student, Slippery Rock University, United States

The present study analyses the Automatic Vehicle Location (AVL) data in a rural transportation system. We measure on-time performance, and propose changes to the schedule in order to improve performance reliability. We identified problems with schedule adherence and possible problems with the operations of the route.

- 060-1731** Developing a Course Scheduling Program for the USF Industrial Engineering Department
Anthony Niznik, Student, University of South Florida, United States

Saturday, 11:30 AM - 01:00 PM

The Industrial Engineering Department at the University of South Florida schedules courses manually. A GAMS program was created to make the process of scheduling more autonomous. The program minimizes course conflicts and maximizes room utilization. This program has the potential to save the Department both time and money.

226	Saturday, 11:30 AM - 01:00 PM, Morgan	Track: Supply Chain Management
	Session: Models in Supply Chain Management I	
	Chair(s): Marcus Brandenburg	

060-0024 Value Impacts of Supply Chain Management - A Quantitative Model
Marcus Brandenburg, Senior Lecturer, University of Kassel, Germany

Although SCM is identified as a key driver of financial performance, quantifying its influence on company value is difficult and quantitative models to assess value impacts are scant. We formally partition discounted cash flow to four SCM-related value drivers to financially measure and compare impacts of SCM on company value.

060-1354 Non-overlapping vs. Overlapping Temporal Aggregation
Bahman Rostami-Tabar, Lecturer, Ecole Centrale Paris, France
Bahman Rostami-Tabar, Lecturer, Ecole Centrale Paris, France

Demand forecasting performance is subject to the uncertainty underlying the time series an organization is dealing with. One intuitively appealing approach to reduce uncertainty and improve forecast accuracy is temporal aggregation. In this study, we investigate the relative effectiveness of non-overlapping versus overlapping temporal aggregation.

060-0132 Tridimensional Supply Evaluation Matrix: A Supplier Management Instrument
Carla Hollerweger, Student, UNISINOS, Brazil
Rafael Teixeira, Assistant Professor, UNISINOS, Brazil

Our study builds an instrument to evaluate and classify suppliers, considering three dimensions: supply complexity, impact on results, and supply dependence. We collected data from 178 buyers of a focal company. We validated our measurement instrument and classify suppliers in a three dimensional matrix, showing their strategic position.

227	Saturday, 11:30 AM - 01:00 PM, Northwest	Track: Revenue Management and Pricing
	Session: Revenue Management with Strategic Customers	
	Chair(s): Shiliang Cui	

060-0230 Inventory Announcements with Strategic Customers: A Structural Estimation Approach
Kate Ashley, Student, University of California Berkeley, United States
Pnina Feldman, Assistant Professor, University of California Berkeley, United States
Jun Li, Assistant Professor, University of Michigan Ann Arbor, United States

Does inventory announcement affect the timing of consumer purchases? We estimate the impact of inventory announcement policy on purchases of airline tickets. We analyze the extent to which customers treat messages from the firm as cheap talk or credible information, and characterize the conditions under which various policies are preferred.

060-0481 Searching for Better Quality and Shorter Queue
Luyi Yang, Student, University of Chicago, United States
Laurens Debo, Associate Professor, University of Chicago, United States
Varun Gupta, Assistant Professor, University of Chicago, United States

In a many-server queueing system, servers have different qualities and customers do not know either the quality of the server or its queue length in advance, and have to conduct costly sequential search. We characterize the equilibrium search behavior and discuss its impact on the service provider's revenue.

060-0906 Responsive Pricing of Fashion Products: The Effects of Demand Learning and Strategic Consumer Behavior
Mike Wei, Assistant Professor, University of Buffalo, United States
Yossi Aviv, Professor, Washington University St Louis, United States
Fuqiang Zhang, Associate Professor, Washington University St Louis, United States

This paper studies a fashion retailer's dynamic pricing problem under the presence of demand learning and strategic consumer behavior. We examine the responsive pricing strategy and find that its performance is greatly compromised due to two effects caused by strategic consumers: the manipulation effect and the spread effect.

060-0723 Blind Queues: The Impact of Consumer Beliefs on Revenues and Congestion
Shiliang Cui, Assistant Professor, Georgetown University, United States
Senthil Veeraraghavan, Associate Professor, University of Pennsylvania, United States

In many service settings, consumers join the queue without being fully aware of the parameters of the service provider. In such "blind" queues, consumers typically make their decisions based on limited service information. We study the impact of consumer beliefs over the service parameters on firm revenues and system congestion.

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Saturday, 11:30 AM - 01:00 PM, Oak Lawn

Track: Operations Management Practice*Session:* Predictive modeling: Opportunities and Impact on Operations in Microelectronics Manufacturing*Chair(s):* Robert Baseman**060-1636** Predictive Maintenance Modeling: Requirements for Microelectronics Manufacturing Fab-wide Solutions

James Moyne, Technology Specialist, Applied Materials, United States

Michael Armacost, Director of Advanced Services Engineering, Applied Materials, United States

Predictive Maintenance (PdM) is leading the move from reactive to predictive operations in Microelectronics Manufacturing. Practical solutions must be robust, maintainable, portable and fab-wide. Required elements discussed include fab-wide deployment framework, re-usable data quality enhancement tools, model context dependency determination, incorporation of equipment/process knowledge, disturbance rejection and model maintenance.

060-1661 The Evolution of Manufacturing Scheduling by Predictive Analytic Inputs

Timothy Miller, Deputy Director Manufacturing Technology, GLOBALFOUNDRIES, United States

In the Semiconductor manufacturing field, automation plays a crucial role in remaining cost competitive. Automation has even extended into the area of product run path scheduling. Predictive analytics is providing new inputs to make better automated decisions surrounding tool maintenance downtime decisions and product run path risk mitigation.

060-1729 A New Spatial Anomaly Detection Algorithm with Multiple Spatial Maps in Multistage Manufacturing Systems

Byunghoon Kim, Student, Rutgers University, United States

Young-Seon Jeong, Assistant Professor, Chonnam National University, Korea, Republic of (South Korea)

Seung Hoon Tong, R&D, Samsung Electronics Co. Ltd, Korea, Republic of (South Korea)

In-Kap Chang, R&D, Samsung Electronics Co. Ltd, Korea, Republic of (South Korea)

Myong Jeong, Associate Professor, Rutgers University, United States

The prompt detection of abnormal dynamic random access memory (DRAM) wafers based on multiple maps is a primary issue that challenges the process to increase yield rates. We present a new spatial anomaly detection algorithm for detecting abnormal DRAM wafers. The proposed procedure is validated using real life DRAM wafers.

060-1660 Predictive Modeling and Control for Virtual Metrology Applications

Emmanuel Yashchin, xx, IBM T. J. Watson Research Center, United States

Robert Baseman, Senior Technical Staff Member, IBM T.J. Watson Research Center, United States

Yada Zhu, Research Staff Member, International Business Machines (IBM), United States

Virtual metrology applications present the opportunity to reduce the number of physical measurements and contribute to process control. In this talk, we discuss a novel predictive model and associated control protocols that we have developed. We also discuss other potential applications using virtual metrology.

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Saturday, 11:30 AM - 01:00 PM, Parlor A

Track: General Track*Session:* Project and Process Management*Chair(s):* Yucan Wang**060-0139** Balanced Scorecard Use at a Small Financial Firm in Southeastern Brazil

Ludimilla Castañon, Student, Universidade Federal De Juiz De Fora, Brazil

Melina Alves, Student, Univ Federal Do Minas Gerais, Brazil

Luiz Alves, Professor, Universidade Federal De Juiz De Fora, Brazil

Presents the Balanced Scorecard and the results of its application at a small financial investments business in southeastern Brazil. The application of this tool, plus good management, enabled significant improvements in organizational performance and climate, attracting new customers, increasing revenues by 23% and profits by 38%.

060-0247 The Balanced Scorecard (BSC) in Higher Education Institutions (HEIs): A Management Improvement Strategy

Tonny Rodrigues, Associate Professor, Federal University of Rio De Janeiro, Brazil

Átila Lira, Associate Professor, Faculdade Santo Agostinho, Brazil

Irenilza Nãas, Professor, UNIP, Brazil

Can managers of Brazilian HEI's use the BSC to improve the decision-making process? The answer to this question guided this study that found the efficiency of this business strategy in the educational context of Brazilian higher education expansion.

060-1448 Earned Value Analysis in Project Management: Survey and Research Potential

Milind Padalkar, Student, Indian Institute of Management Kozhikode, India

Saji Gopinath, Professor, Indian Institute of Management Kozhikode, India

Earned Value Management is widely used to measure project performance. Yet, its effectiveness in practice or how it has been adapted for different situations has not been studied. This paper surveys academic and practitioner literature on EVM and its extensions in view of information technology delivering superior and faster information.

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Saturday, 11:30 AM - 01:00 PM, Parlor B
Session: Building Resilient Supply Chains
Chair(s): Yacob Khojasteh

Track: Risk Management in Operations

- 060-0743** A Study of the Relationship between Firm Size and Safety Performance in the US Motor Carrier Industry
David Cantor, Associate Professor, Iowa State University, United States
Prabhjot Singh, Student, Iowa State University, United States
Thomas Corsi, Professor, University of Maryland, United States
Curtis Grimm, Professor, University of Maryland, United States

The purpose of our study is to examine the relationship between firm size and safety performance in US motor carrier industry. This study develops theoretical insights based on the resource-based view of firm and provides an important managerial and public policy implications.

- 060-0769** How Outsourcing Firms Could Avoid Lock-in to Supplier Situation and Potential Supplier Hold-up
Sherwat Elwan Ibrahim, Associate Professor, German University in Cairo, Egypt
Khaled El Tahawy, Outsourcing Manufacturing Manager/Team Leader, PGS Cairo - Pfizer Egypt, Egypt

In a strategic outsourcing arrangement, power distribution along the dyadic relationship is always imbalanced with the outsourced firm at a power disadvantage. This power is derived from the outsourced firm's dependence on the supplier, and the supplier's potential opportunistic behaviour. This study investigates how outsourced firms could avoid lock-in situation

- 060-0761** A Multi-objective Robust Optimization Model for Supply Chain Risk Mgmt - Tradeoff between Flexibility and Agility
Vahid Nooraie, Student, North Carolina A&T State University, United States
Mahour Mellat-Parast, Assistant Professor, North Carolina A&T State University, United States
Saeed Marvizadeh, Operations Research Analyst, Ascend Learning , United States

We develop a supply risk model where we examine the trade-off between flexibility and agility. A robust multi-objective model is developed to capture the stochastic nature of the supply chain. The results show that the model provides a promising approach to perform an efficient production planning for a supply chain.

- 060-0505** Measuring Supply Chain Resilience with Consideration of Customer Behavior
Milad Baghersad, Student, Virginia Polytechnic Institute And State University, United States
Christopher Zobel, Professor, Virginia Polytechnic Institute And State University, United States

Assessing supply chain resilience can help managers achieve insight into the impact of disruptions on system performance. Furthermore, customers' reactions to such disruptions can significantly impact this resilience. With this in mind, this paper uses simulation to discuss the advantages of incorporating customer reactions into the assessment of resilience.

- 060-0237** Supply Chain Risk Management in the Japanese Automotive Industry: An Empirical Study
Yacob Khojasteh, Associate Professor, Sophia University, Japan
Yasutaka Kainuma, Associate Professor, Tokyo Metropolitan University, Japan

This paper presents an empirical analysis of the current status and challenges of supply chain risk management in the Japanese automotive industry. We investigate the vulnerability of supply chains, efforts toward lowering the supply chain risks, and probability and impact of the risks.

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Saturday, 11:30 AM - 01:00 PM, Columbia 5-8
Session: Practice Leaders Semi-Plenary: Operations Challenges and Opportunities 2
Chair(s): Christopher Tang

Track: Meetings & Symposiums

- 060-1713** Operations: Challenges and Opportunities from Practitioners' Perspective - 2
ManMohan Sodhi, Professor, Cass Business School, United Kingdom
Nicole DeHoratius, Professor, University of Chicago, United States

This session presents various operational challenges observed by Practitioners in three different industries: Online retailing, technology innovation, and technology products & services. These challenges create research opportunities for OM researchers.

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Saturday, 03:45 PM - 05:15 PM, Columbia 1

Track: Behavior in Operations Management*Session:* "Relevance" session: Economics and BIOM*Chair(s):* Beatrice Boulou-Reshef**060-0540** Cry Wolf or Equivocate? Credible Forecast Guidance in a Cost-loss Game

Gary Bolton, Professor, University of Texas Dallas, United States

Elena Katok, Professor, University of Texas Dallas, United States

We test two ways to communicate uncertainty information in forecasts – provide the probability of the uncertain event of interest, or provide an explicit recommendation. We find that recommendations are more successful at inducing the ex ante action but are more vulnerable to the cry wolf effect.

060-1527 Choice of Routes vs. Choice of Segments: Effects of Real-time Information in Traffic Networks

Vincent Mak, Assistant Professor, University of Cambridge, United Kingdom

Eyrán Gisches, Lecturer, University of Arizona, United States

Amnon Rapoport, Emeritus Professor, University of Arizona, United States

We report the results of an experimental study of route choice in traffic networks under two information structures. Although the complexity of the network defies analysis, choice patterns converge rapidly to equilibrium. We account for the observed results by a Markov learning model postulating regret minimization and inertia.

060-1637 Dynamic Pricing of Scarce Products: An Experimental Study of Seller-buyer Interactions

Vincent Mak, Assistant Professor, University of Cambridge, United Kingdom

Amnon Rapoport, Professor, University of California Riverside, United States

Eyrán Gisches, Lecturer, University of Arizona, United States

We propose and then experimentally test a model of strategic seller-buyer interactions in a market with dynamic pricing characteristics and scarcity constraints. Aggregate decisions in our experiment largely approximated rational expectations equilibrium. However, we also observe that sellers were boundedly strategic while buyers exhibited systematic deviations from best response predictions.

060-1643 Wishful Thinking That Enhances Generosity

Pablo Branas-Garza, Professor, Middlesex University, United Kingdom

This paper presents a variation of the dictator game where participants are both dictators and recipients. Due to this variation subjects become more generous. A second variation with paired couples increases donations more. We do find that: expected donations are notably higher in paired sessions; donations are correlated to expectations.

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Saturday, 03:45 PM - 05:15 PM, Columbia 2

Track: Behavior in Operations Management*Session:* Individual Aspect in Operations Management*Chair(s):* Elliot Bendoly**060-0905** Visualization as an Analytical Tool among Heterogenous Users: Opportunities, Caveats and Guidelines

Elliot Bendoly, Professor, Ohio State University, United States

Brett Massimino, Assistant Professor, Cornell University, United States

Visualization assists data validation, cleaning and aggregation. It facilitates relationship exploration and is fundamental to end-result conveyance. Increasingly it also involves individuals with very different backgrounds, biases and modes of interpretation. This work intends to shed light on common threads, approaches and risks faced by those in practice and research.

060-0268 Personal Operations Management: A Research Agenda

Arthur Hill, Professor, University of Minnesota, United States

Susan Goldstein, Associate Professor, University of Minnesota, United States

Most OM research has been conducted at the firm, plant, and workgroup level of analysis. This research focuses on how individual knowledge workers can improve their personal effectiveness and efficiency using OM theory, tools, and techniques. We review the literature, present a framework, and propose a research agenda.

060-0323 Integrating BOPS into OM Courses with Emphasis on the Use of Socio-technical Systems Theory

Joel Goldhar, Professor, Illinois Institute of Technology, United States

Arjun Chakravarti, Assistant Professor, Stuart School of Business Administration, United States

Matt Lauritsen, Student, Illinois Institute of Technology, United States

Despite the recent increased interest in BOPS research; few efforts have been made to formally integrate Organization Behavior and Design into OM courses. We offer a set of models from Social Psychology that can help create an 'Integrated Process-Structure Model' and an example of a course syllabus using these models.

060-0197 A Structural Contingency Perspective on Quality Innovation: The Impact of Ethical Evaluation

Marc Schniederjans, Professor, University of Nebraska Lincoln, United States

Dara Schniederjans, Assistant Professor, University of Rhode Island, United States

Quality management has the potential to invigorate an organization's product, process and administrative innovation, but only when strategically aligned with internal contingencies. In this paper we assess the impact of structural contingency factors and ethical considerations within the relationship between quality management and innovation.

- 060-0972** Hidden Markov Model to Estimate the Time Preference of Individuals
Rahul Marathe, Associate Professor, Indian Institute of Technology Madras, India
Yamini Srinivasan, Student, Indian Institute of Technology Madras, India

The workers in manufacturing and service firms are classified based on their preferences over time as present biased, future biased and time consistent. We use hidden markov model to identify the type of worker and offer different compensation scheme for each type based on their amount of work done.

235	Saturday, 03:45 PM - 05:15 PM, Columbia 3	<i>Track:</i> Empirical Research in Operations Management
	<i>Session:</i> Empirical Research - Experiments	
	<i>Chair(s):</i> Rachna Shah	

- 060-0279** The Marketing Dilemma: To Market or Not to Market during a Competitor's Product Harm Crises
Adams Steven, Assistant Professor, Year, United States
Amirhossein Alamdar Yazdi, Student, University of Massachusetts Amherst, United States

What is the impact of advertising on a firm's performance during unfavorable news coverage of a close competitor? Positive? Likely. Negative? Possible. This study investigates the effect of advertising intensity on a firm's marketing and financial performance and the moderating influence of a competitor's product recalls.

- 060-1629** A Critical Review of "Experimental Research" in Operations Management: Opportunities and Challenges
Anna Errore, Student, University of Minnesota, United States
Rachna Shah, Associate Professor, University of Minnesota, United States

As fundamental approach to scientific inquiry, experimentation has recently grown in popularity and number of applications in operations management. We review research studies in top management journals and explore critical aspects and peculiarities of several kinds of experimental studies, from laboratory to field, to more recent large scale social experiments.

- 060-1640** Corporate Environmental and Financial Performance: An Empirical Investigation
Kedong Chen, Student, University of Minnesota, United States
Rachna Shah, Associate Professor, University of Minnesota, United States

This study examines the association between corporate environmental rating performance (CEP) and financial performance (CFP) using KLD and Compustat data. Results show a positive relationship contingent on industries where environmental strength is more significant than concern. We also find inventory turnover as proxy for resource utilization positively moderates the relationship.

236	Saturday, 03:45 PM - 05:15 PM, Columbia 4	<i>Track:</i> Retail Operations Management
	<i>Session:</i> Supply Chain Management and Retail Operations	
	<i>Chair(s):</i> Jing Zhou	

- 060-0060** Early Salvaging of Seasonal Inventory in the Newsvendor Problem
Moutaz Khouja, Professor, University of North Carolina Charlotte, United States
Jing Zhou, Associate Professor, University of North Carolina Charlotte, United States

We analyze a manufacturer-retailer supply chain. Upon demand realization at the beginning of the season, the retailer either sell excess inventory to an off-price retailer or wait till the end of season. The retailer and off-price retailer have their own exclusive consumer segments and share a dual consumer segment.

- 060-0468** Supply Chain Power and Store Brand
Jun Ru, Assistant Professor, SUNY at Buffalo, United States
Ruixia Shi, Assistant Professor, University of Richmond, United States
Jun Zhang, Professor, Fudan University, China

This paper relates a retailer's store brand strategy to the relative powers of channel members and offers a new explanation for the differences in retailers' store brand strategies. Our analysis shows that store brands become less appealing to a retailer as it becomes more powerful

- 060-0617** Role of Cooperative Advertising under Various Information Sharing Scenarios
Linda (Xiaowei) Zhu, Associate Professor, West Chester of PA, United States
Ting Zhang, Student, City University of Hong Kong, China

A manufacturer sells a product to a retailer where they adopt a cooperative advertising strategy. We propose several forecast systems to predict the uncertainty in advertising elasticities: Non-Information Sharing, Information Sharing, and Retailer Forecasting cases. We derive the optimal retail price, wholesale price, and related advertising costs.

- 060-0702** Product Returns in Distribution Channel
Meng Li, Student, University of Illinois Urbana-Champaign, United States
Yunchuan Liu, Associate Professor, University of Illinois Urbana-Champaign, United States

Many retailers and manufacturers are adopting the practice of accepting product returns from consumers (via money-back guarantee) and retailers (via full-credit returns), respectively. In this paper, we investigate equilibrium returns policies of retailers and manufacturers when returns are due to both overstock inventory and consumer returns.

060-0747 The Effect of Targeted Coupons on Quality Choices and Competition

Amit Eynan, Professor, University of Richmond, United States

Benny Martin, Assistant Professor, University of Waterloo, Canada

A manufacturer who faces customers with heterogeneous valuation of quality can segment the market by offering multiple products at different qualities and prices. Buyers will self-select the product that maximizes their utility. We investigate the effect of targeted marketing efforts (coupons) on product line of a monopolist and under competition.

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Saturday, 03:45 PM - 05:15 PM, Columbia 9

Track: Empirical Research in Operations Management

Session: Emerging Markets Empirical Research

Chair(s): Tonny Rodrigues

060-0012 Proposition Factor Model of World Class Manufacturing in Brazilian Enterprises

Paulo Oliveira, Professor, Universidade Ibirapuera, Brazil

Luciano Silva, Associate Professor, Universidade Nove De Julho, Brazil

Dirceu Silva, Professor, Universidade Nove De Julho, Brazil

Meire Lopes, Professor, Universidade Nove De Julho, Brazil

This article aims to develop a model of World Class Manufacturing (WCM). Therefore, it was designed questionnaire with 35 assertions that were divided into seven areas through literature review. The data were analyzed by Factor Analyzes: Lean Manufacturing; Human Resource Management to achieve Fleibility; Integration with Marketing; Cost Reduction; Flexibility.

060-1582 The Impact of Green Logistics Practices on Firm Performance: Evidence from Turkish Healthcare Industry

Kazim Sari, Associate Professor, Beykent University, Turkey

Gozde Yanginlar, Lecturer, Yenyuzuyil University, Turkey

This research aims to investigate relationship between green logistics practices and firm performance in healthcare organizations. For this purpose, a conceptual model is developed from related literature. Then, data were collected through a questionnaire-based survey from hospital managers in Turkey. Data is analyzed with explanatory factor analysis and regression methods.

060-0249 Difficulties and Dilemmas of Adaptation: The Balanced Scorecard in the Context of Brazilian HEIs

Tonny Rodrigues, Associate Professor, Federal University of Rio De Janeiro, Brazil

Átila Lira, Associate Professor, Faculdade Santo Agostinho, Brazil

Irenilza Nääs, Professor, UNIP, Brazil

Daniel Oliveira, Student, Faculdade Santo Agostinho, Brazil

When analyzing the adoption of the BSC to the context of Brazilian Higher Education Institutions must adapt the method to the institution or the institution for the method? To answer this question, we analyzed the reality of a private institution that has found it difficult to deploy this tool.

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Saturday, 03:45 PM - 05:15 PM, Columbia 10

Track: Sustainable Operations

Session: Novel Sustainable Business Models

Chair(s): Vishal Agrawal

060-0259 Extended Producer Responsibility (EPR) and Secondary Markets

Isil Alev, Student, Georgia Institute of Technology, United States

Vishal Agrawal, Assistant Professor, Georgetown University, United States

Atalay Atasü, Associate Professor, Georgia Institute of Technology, United States

EPR-based take-back legislation is the prevalent policy for several durable products such as electronics; however, existing analysis ignores durable nature of the products and secondary markets. Accordingly, we analyze the effectiveness of EPR in the presence of secondary markets and show that it may result in unintended adverse environmental outcomes.

060-0277 Competition and Firms' Willingness to Implement Industrial Symbiosis

Yunxia Zhu, Assistant Professor, Rider University, United States

Milind Dawande, Professor, University of Texas Dallas, United States

Srinagesh Gavirneni, Associate Professor, Cornell University, United States

Vaidy Jayaraman, Associate Professor, University of Miami, United States

Industrial Symbiosis is a resource-sharing strategy that encourages traditionally separate industries to exchange water, energy and by-products. Inspired by the paper-sugar industrial complex, we model and analyze symbiotic systems and establish that competition from firms that produce only regular (both regular and green) products encourages (discourages) implementation of industrial symbiosis.

060-0311 The Potential of Servicing as a Green Business Model

Vishal Agrawal, Assistant Professor, Georgetown University, United States

Ioannis Bellos, Assistant Professor, George Mason University, United States

In recent years, manufacturers in various industries have begun to orient their practices towards selling the use of the product as opposed to selling the product itself. We investigate the economic and environmental implications of the manufacturer's design and pricing decisions under different forms of servicing business models.

060-1202 Business Models and System Performance: Empirical Evidence from the U.S. Solar Energy Market

Jose Guajardo, Assistant Professor, University of California Berkeley, United States

We empirically analyze the relationship between business models and system performance in the U.S. solar energy market, characterizing the drivers and mechanisms by which different business models affect system performance.

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Saturday, 03:45 PM - 05:15 PM, Columbia 11
Session: Challenges Faced by Developing Countries
Chair(s): Ruoqi Geng

Track: Sustainable Operations

060-0586 Greening Manufacturing Supply Chains in Asia's Emerging Economies: A Meta-analysis of Empirical Evidence

Ruoqi Geng, Student, Brunel University, United Kingdom

Afshin Mansouri, Senior Lecturer, Brunel University, United Kingdom

Emel Aktas, Senior Lecturer, Cranfield University, United Kingdom

Green supply chain management (GSCM) is becoming increasingly adopted by manufacturing companies in the Asian emerging economies. However, empirical studies analysing the impact of GSCM practices on performance are not conclusive. In this paper, we conduct a meta-analysis to examine the relationship between GSCM practices and firm performance.

060-1652 Impact of Sustainable Supply Chain Management Practices on Organizational Performance: An Indian Perspective

Debadyuti Das, Associate Professor, Faculty of Management Studies, University of Delhi, India

The present work is an attempt to investigate the impact of Sustainable Supply Chain Management practices on overall organizational performance encompassing all three dimensions of sustainability with reference to diverse range of industries based in India. The analysis is carried out with the help of SEM considering the natural logarithm of employee strength as a control variable. The findings of the study provide rich managerial insights.

060-0779 Sustainable Practices as Dynamics Capabilities on Sugarcane Industry in Brazil

Luciana Cezarino, Assistant Professor, Federal University of Uberlândia - UFU, Brazil

Lara Liboni, Assistant Professor, University of São Paulo - USP, Brazil

Adriana Caldana, Assistant Professor, University of São Paulo - USP, Brazil

Marlon Fernandes, Student, University of São Paulo - USP, Brazil

The aim of this paper is to analyze the development of changes in operations management towards sustainability by a case study. The results show that Balbo company, Brazilian sugarcane industry, has develop new ways to change and adapt in a disturbing environment was able to built dynamics capabilities.

060-1272 Feasibility of Adaptive Water Management for Developing-countries Urban Context Using Multi-criteria Decision

Farideh Delavari Edalat, Assistant Professor, Bradford University, United Kingdom

M Reza Abdi, Assistant Professor, Bradford University, United Kingdom

Water management performance based on three main Adaptive Water Management (AWM) characteristics: polycentric governance, institutional flexibility and public participation is investigated. An analytical hierarchical process (AHP) model is proposed to evaluate the attitude towards Water Supply Management (WSM) and AWM as two alternative approaches with respect to the key characteristics.

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Saturday, 03:45 PM - 05:15 PM, Columbia 12
Session: CHOM Best Paper Competition Finalists Presentation
Chair(s): Vikram Tiwari Kurt Bretthauer

Track: Healthcare Operations Management

060-0562 Bundled Payments for Healthcare Services

Mili Mehrotra, Assistant Professor, University of Minnesota, United States

Diwakar Gupta, Professor, University of Minnesota, United States

We model the proposer-selection and information-sharing problems that arise when implementing CMS' BPCI initiative. Possessing private information, proposers compete for beneficiaries but not for selection. We show that an optimal strategy for CMS is to either announce a fixed threshold or keep the selection process uncertain, depending on market characteristics.

060-0729 Heterogeneous Elective Patients' Flow Modeling and Scheduling at Hospital

Chitta Ranjan, Student, Georgia Institute of Technology, United States

Kamran Paynabar, Assistant Professor, Georgia Institute of Technology, United States

Jonathan Helm, Assistant Professor, Indiana University, United States

A novel semi-markov model(SMM) based clustering is developed for flow modeling of patients by dividing them into homogeneous groups. Clustering and Scheduling Integrated(CSI) approach is proposed that uses SMM output in Mixed Integer Programming for effective scheduling of hospital resources. Simulation validation and case study showed it outperforms existing methods.

060-0278 Cohort Turnover and Productivity: The July Phenomenon in Teaching Hospitals

Robert Huckman, Professor, Harvard University, United States

Saturday, 03:45 PM - 05:15 PM

Hummy Song, Student, Harvard University, United States

Jason Barro, Partner, Unaffiliated, United States

We consider the impact of cohort turnover on productivity. Specifically, we examine the impact of the July turnover of residents in American teaching hospitals on hospital productivity. We find that this turnover results in increased resource utilization in minor and major teaching hospitals and decreased quality in major teaching hospitals.

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Saturday, 03:45 PM - 05:15 PM, Piscataway

Track: Inventory Management

Session: Managing Production and Inventory under Information Updating

Chair(s): Candace Yano

060-0109 Optimal Merchandise Testing with Limited Inventory

Zhe Wang, Student, University of North Carolina Chapel Hill, United States

Adam Mersereau, Assistant Professor, University of North Carolina Chapel Hill, United States

Li Chen, Associate Professor, Duke University Durham, United States

We consider a fashion retailer allocating limited inventory to its stores for a “merchandise test” before the main selling season. The key tradeoff is between the quality and quantity of demand observations obtained. We distinguish between cases in which the retailer observes and does not observe timestamps of sales transactions.

060-0116 To Wait or Not to Wait: Production Decisions for New Products under Yield Learning and Improvement

Candace Yano, Professor, University of California Berkeley, United States

Kai-Chuan Yang, Student, University of California Berkeley, United States

Manufacturers launching new products can schedule the first production run early, allowing them to learn about the yield and to improve it. But early production would occur before an accurate demand forecast is available, thus risking overproduction. We explore how a firm facing in-season capacity constraints should optimize these decisions.

060-0117 Offshoring versus Reshoring: A Tug-of-War Between Operational Flexibilities

Li Chen, Associate Professor, Duke University Durham, United States

Bin Hu, Assistant Professor, University of North Carolina Chapel Hill, United States

Reshoring refers to the emerging practice of once-offshoring manufacturers moving their factories back onshore. We show that the market and supply proximities enable different operational flexibilities, leading to an operational tradeoff between offshoring and reshoring. We identify operational strategies that can shift the preferences between the two.

060-0395 Learn and Screen: A Strategic Approach to Bayesian Inventory Management

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

Bharadwaj Kadiyala, Student, University of Texas Dallas, United States

Alain Bensoussan, Professor, University of Texas Dallas, United States

We propose a dynamic mechanism for a supplier who periodically replenishes inventory with partial knowledge of demand distribution. By combining the best of Bayesian updating and screening mechanism, we show that in addition to minimizing costs, inventory decisions also serve a strategic purpose in eliciting demand information from the buyer.

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Saturday, 03:45 PM - 05:15 PM, Cardozo

Track: Information in Operations Management

Session: Marketing and Operations Management Interface

Chair(s): Ramkumar Janakiraman

060-0657 Evolution of Social Media Sentiments for Individual Human Brands: Evidence from Indian Election

Rakesh Mallipeddi, Student, Texas A&M University College Station, United States

Ramkumar Janakiraman, Associate Professor, Texas A&M University College Station, United States

Subodha Kumar, Professor, Texas A&M University College Station, United States

Seema Gupta, Assistant Professor, Indian Institute of Management Bangalore, India

We study the evolution of social media sentiments for individual human brands. Set in the context of Indian election, we collected data for six months during/before the Indian elections. We examine the spillover effect between individual candidates and parties.

060-0945 The Effect of Cyberattack on Customers' Purchase and Channel Choice Behavior: Evidence from a Natural Experiment

Ramkumar Janakiraman, Associate Professor, Texas A&M University College Station, United States

Joon Ho Lim, Student, Texas A&M University, United States

Rishika Rishika, Assistant Professor, Marketing Department, United States

Subodha Kumar, Professor, Texas A&M University College Station, United States

Ram Bezawada, , ,

Cybercrimes are becoming more common and retailers and businesses incur enormous costs to recover from problems associated with cyberattack. We position our study to be the first to examine the short term effects of announcement of data breach on a retailer's customers' actual purchase behavior. Based on change in customers' spending behavior and frequency of shopping trips, we quantify the economic impact of a cyberattack.

060-1486 The Effects of Multichannel Retailer Policy Changes on Customer Behavior

Saturday, 03:45 PM - 05:15 PM

Ramkumar Janakiraman, Associate Professor, Texas A&M University College Station, United States

Joon Ho Lim, Student, Texas A&M University College Station, United States

Subodha Kumar, Professor, Texas A&M University College Station, United States

Multichannel retailers often look into ways by which they can make shopping and buying effortless for their customers. This study examines and quantifies the returns of policy changes aimed at integration of shopping across different channels.

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Saturday, 03:45 PM - 05:15 PM, Du Pont

Track: Humanitarian and Not-for-profit Operations

Session: Empirical Research in Humanitarian Logistics: Advances and Lessons from disasters and extreme events

Chair(s): Felipe Aros-Vera Jose Holguin-Veras

060-0328 Temporary Hubs for the Global Vehicle Supply Chain in Humanitarian Operations

Jon Stauffer, Student, Indiana University, United States

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

Luk van Wassenhove, Professor, INSEAD, France

Using actual IHO data we obtain vehicle demand following the Haiti earthquake and multiple development programs. We find that secondary support demand for vehicles is different from primary beneficiary demand for food and water. We also show how temporary hubs in mega disaster areas can balance costs and responsiveness.

060-1127 A Disaster Management Framework Based on the Overview of the Existent Tools on Top of a Multi-criteria Decision

Daniel Eckhardt, Student, Pontifica Universidade Catolica Do Rio De Janeiro- Puc Rio, Brazil

Adriana Leiras, Assistant Professor, Pontifica Universidade Catolica Do Rio De Janeiro- Puc Rio, Brazil

This work seeks for an understanding of systems used during disaster preparation and response based on three main concepts: literature review; system and tools usage; Analytic Hierarchy Process multicriteria decision model applied with specialists. A framework based on the strengths of each of them is proposed to improve humanitarian operations.

060-1287 Deprivation Cost Functions for Water: Results from a Contingent Valuation Experiment

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

Johanna Amaya, Student, Rensselaer Polytechnic Institute, United States

Felipe Aros-Vera, Reader, Rensselaer Polytechnic Institute, United States

Miguel Jaller, Assistant Professor, University of California Davis, United States

This paper describes the models estimated resulting from a contingent valuation experiment to establish the economic value of human suffering brought about by water deprivation. Resulting deprivation costs functions could be incorporated into humanitarian logistics mathematical models providing a more accurate way to maximize the impacts of delivery actions.

060-1100 Pre-positioning Relief Supplies in Brazil Using Stochastic Optimization and Multi-criteria Decision Analysis

Irineu Brito Jr, Student, Universidade De Sao Paulo, Brazil

Adriana Leiras, Assistant Professor, Pontifica Universidade Catolica Do Rio De Janeiro- Puc Rio, Brazil

Hugo Yoshizaki, Associate Professor, University of São Paulo, Brazil

This paper proposes a methodology to define locations for pre-positioning disaster relief supplies through a two-stage stochastic optimization model with multi-criteria decision analysis. An application in Brazil illustrates the effectiveness of the proposed approach. Results show that consideration of qualitative and quantitative criteria improves decisions in humanitarian operations

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Saturday, 03:45 PM - 05:15 PM, Embassy

Track: Product Innovation and Technology Management

Session: Firm and Network-level Studies of Innovation

Chair(s): Zoran Perunovic

060-0059 Lean Product Development: An Overview of the Best Global Practices

Ana Julia Dal Forno, Associate Professor, Federal University of Santa Catarina, Brazil

Fernando Pereira, Senior Lecturer, Santa Cruz do Sul University, Brazil

Liane Kippeer, Associate Professor, Santa Cruz do Sul University, Brazil

Joici Genro, Student, Santa Cruz do Sul University, Brazil

Rejane Frozza, Associate Professor, Santa Cruz do Sul University, Brazil

The purpose of this paper is to identify the practices and indicators in the literature about Lean Product Development. Ninety studies were analyzed considering Value Stream Mapping, Suppliers, Standardization, Simultaneous Engineering, Voice of the Consumer, Chief-Engineer, Modularity, Virtual Simulation, Visual Management, Learning Network and others to point to trends.

060-1172 Managing Iterations and Rework in Incremental Product Development

Aravindhan Karuppiah, Student, Xlri Jamshedpur, India

The aim of this research is to study the rework in the context of System on a Chip (SoC) design at Texas Instruments where certain parts are new and certain parts are reused. The relationship between rework effort and new, reused components and complexity of the product is studied.

060-0080 A Study of Knowledge Capital and Innovations in the Mining Industry in Nigeria

Oluseye Jegede, Student, National Centre for Technology Management, Obafemi Awolowo University, Nigeria

The study was carried out to determine the operational activities that drives innovations and productivity in the mining industry in Nigeria using empirical study. The study concluded by providing strategic implications for policy making for government as well as recommendations for practise to the formal companies with in the industry.

060-0100 Six Innovation Networks

Zoran Perunovic, Associate Professor, Technical University of Denmark, Denmark

Mads Christoffersen, Associate Professor, Technical University of Denmark, Denmark

Sofia Furstenberg, Innovation Portfolio Manager, A.P.Moller Maersk Group, Denmark

In this paper we analyze formation, structure, management, evolution, and performance of six different types of innovation networks (ego, triad, opportunistic, horizontal, expert forums, and informal) in the maritime industry.

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Saturday, 03:45 PM - 05:15 PM, Fairchild East

Track: Operations Management Practice

Session: Innovative Industry Applications of OM

Chair(s): Amit Garg

060-1559 An Intelligent Information Gathering System to Improve the State of Food Safety in Singapore

Jayant Kalagnanam, Research Staff Member, International Business Machines (IBM), United States

Kiran Kate, Research Engineer, International Business Machines (IBM), United States

We present a system for web information gathering that improves focused information gathering process using of machine learning to identify and rank content. Experiments demonstrate that our classification approach improves the efficiency by 35% and the ranking approach leads to average 16% improvement in elevating the ranks of relevant articles.

060-1632 Analytics-driven Innovation: How Analytics and Data Are Disrupting Small Business Financing

Krishna Venkatraman, Senior Vice President, Data and Analytics, OnDeck, United States

Technology companies are transforming the way capital flows to small-businesses. Through data and technology, they deliver financing efficiently and quickly, giving customers the speed and convenience of online shopping. Krishna Venkatraman, OnDeck's Senior Vice President of Data and Analytics, will outline the challenges faced in building such systems at OnDeck.

060-1631 Improving User Experience in CRM Apps and Increasing Productivity of Field Sales Force

Amit Garg, CEO, CRMMantra, Inc., United States

Companies spend millions in implementation of CRM systems, however, due to lack of user adoption, these systems do not provide the expected ROI. We describe application of OM to improve system design, user adoption, and sales productivity.

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Saturday, 03:45 PM - 05:15 PM, Fairchild West

Track: Global Operational Issues

Session: Performance Management

Chair(s): Kayvan Lavassani

060-0856 Examining Supply Chain Quality Management in Chinese Automobile Industry

Hu Jiayao, Student, University of Nottingham, United Kingdom

Christos Braziotis, Lecturer, University of Nottingham, United Kingdom

Kim Tan, Reader, University of Nottingham, United Kingdom

Yuanzhu Zhan, Student, University of Nottingham, United Kingdom

The paper focuses on Supply Chain Quality Management (SCQM) in the Chinese automobile industry. Through a comparative study of seven leading OEMs, we elaborate on the major inhibitors that impede Chinese Self-Owned brands in successfully competing with Chinese-Japanese Joint Ventures, and propose a framework for effective SCQM in China.

060-1284 Process Management and Organizational Performance: The Case of Process Utilization in China and North America

Bahar Movahedi, Assistant Professor, North Carolina Central University, United States

Xiaoli Qi, Assistant Professor, Hebei University of Technology, China

Kayvan Lavassani, Assistant Professor, North Carolina Central University, United States

While several studies have investigated the relationship between organizational performance and business process management, however few works have explored the Chinese view of operations management. Base on a comparative empirical study this research furthers the understanding of process management practices in China and North America.

060-0135 Innovation Capability and Internationalization Performance of SMEs: The Role of Institutional Pressures

Kamran Chatha, Associate Professor, Lahore University of Management Sciences, Pakistan

Muhammad Shakeel Sadiq Jajja, Student, Lahore University of Management Sciences, Pakistan

Though technological innovation capability is considered a significant determinant of the internationalization performance of SMEs in the developing countries, results to-date are however inconclusive. We theorize, based on expert interviews and literature review, that institutional pressures moderate this relationship. A hypothesized model to be tested in the future is presented.

060-0749 Impact of Inventory Inaccuracies on Products with Inventory-dependent Demand

Fuqiang Wang, Lecturer, Central South University, China

We explore the impact of inventory inaccuracy on the product whose demand is dependent on inventory level. The shrinkage error and misplacement error are considered. Three approaches of inventory decisions are considered. The results imply the impact of inventory inaccuracy is dependent on both the shrinkage error and demand sensitivity.

- 060-1464** Emerging Market Presence and Emission Performance
Yan Dong, Assistant Professor, University of South Carolina, United States
Manoj Malhotra, Professor, University of South Carolina, United States
Deepa Wani, Student, University of South Carolina, United States
Kefeng Xu, Associate Professor, University of Texas San Antonio, United States

Firms move to emerging markets to sell their products and to outsource their production and supply chains. They may also take advantage of loose regulations in environment protection in emerging market countries. This research empirically investigates the relationship between a global firm's presence in emerging markets and its emission levels

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Saturday, 03:45 PM - 05:15 PM, Gunston West

Track: Marketing and OM Interface

Session: Emerging Issues in Marketing/OM Interfaces

Chair(s): Yi Xu

- 060-1295** Using a Volatility Portfolio to Create a Competitive Marketing Mix
Kyle Cattani, Associate Professor, Indiana University, United States
Suzanne de Treville, Professor, Universite De Lausanne, Switzerland

The value of lead time is high for time-sensitive products with high demand volatility and necessitates a capacity buffer. We evaluate a "volatility" portfolio of time-sensitive and time-insensitive products that uses the capacity buffer to produce the time-insensitive products. The resulting portfolio creates value and wards off competition.

- 060-0457** Push, Pull, and Delayed Payment Contracts When a Manufacturer Expands His Product Line
Lingxiu Dong, Associate Professor, Washington University St Louis, United States
Xiaomeng Guo, Student, Washington University St Louis, United States
Danko Turcic, Assistant Professor, Washington University St Louis, United States

Supply chain contracts vary by the inventory responsibility imposed on supply chain members and the timing of payment. We consider three basic wholesale price contracts, push, pull, and delayed payment contracts. Our research focus on studying the effect of changing contracts on the manufacturer's product line expanding

- 060-1082** "Whisper or Shout?" Consumer Adoption Behavior for New Products with Capacity Constraints
Surya Pathak, Associate Professor, University of Washington Bothell, United States
P.V. Balakrishnan, Professor, University of Washington Bothell, United States

We introduce a new consumer adoption behavior model in a capacity constrained new product diffusion environment. Using an agent-based model and a genetic algorithms based estimation procedure we show with empirical data that consumer behavior may range between whispering to shouting for a range of new product categories.

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Saturday, 03:45 PM - 05:15 PM, Coats

Track: Economics Models of Operations

Session: Game Theoretic Models

Chair(s): Leon Chu

- 060-0154** On Contests with Heterogeneous Solvers
Soo-Haeng Cho, Associate Professor, Carnegie Mellon University, United States
Ersin Korpeoglu, Student, Carnegie Mellon University, United States

In a contest in which heterogeneous agents make efforts to develop solutions, existing theories predict different outcomes about how agents will change their efforts in response to more participants. This paper presents a unifying model that encompasses different types of heterogeneity, and offers a precise explanation about agents' rational behavior.

- 060-0232** Public Forecast Information Sharing in a Market with Competing Supply Chains
Hyoduk Shin, Assistant Professor, University of California San Diego, United States
Noam Shamir, Assistant Professor, Tel Aviv University, Israel

Studying an operational motivation of a retailer to publicly announce his forecast information, we show that by making forecast information publicly available to both his manufacturer and to the competitor, a retailer can credibly share his forecasts. An outcome that cannot be achieved by exchanging information within a supply chain.

- 060-0342** Simple Contracts for Reliable Supply
Woonam Hwang, Student, London Business School, United Kingdom
Nitin Bakshi, Assistant Professor, London Business School, United Kingdom
Victor DeMiguel, Associate Professor, London Business School, United Kingdom

We study how the simple wholesale price contract, coupled with a refined understanding of the operational and economic features of a setting with unreliable supply, can lead to the substantially high surplus. Hence, although theoretically suboptimal, the simple contract may be the preferred mode of contracting.

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Saturday, 03:45 PM - 05:15 PM, Monroe

Track: Product Innovation and Technology Management*Session:* Managing Search and Problem Solving in Innovation Settings*Chair(s):* Sezer Ulku**060-0557** Learning in Sequential Search Problems

Asa Palley, Student, Duke University Durham, United States

Mirko Kremer, Professor, Frankfurt School of Finance & Management, Germany

We study the effect of limited information in a sequential search problem where a single selection must be made from a set of random potential options. We present the results of an experiment testing stopping decisions in this setting, examining how simple behavioral patterns can account for the observed data.

060-0750 Search for the Best Alternative: An Experimental Approach

Gulru Ozkan-Seely, Assistant Professor, Georgia Institute of Technology, United States

David Hall, Assistant Professor, Wright State University, United States

Jeremy Hutchison-Krupat, Assistant Professor, University of Virginia, United States

Fred Switzer, Professor, Clemson University, United States

Using a behavioral approach, we examine the strategy of decision makers who search for the best alternative to develop into a new product. The impacts of facing a set of radical or incremental set of alternatives and the level of time-sensitivity on the evolution of decision makers' performances are analyzed.

060-1471 Search under Constraints - An Experimental Study

Sezer Ulku, Associate Professor, Georgetown University, United States

In contexts of innovation, slack resources are required due to the many unknowns. At the same time, according to some, "necessity is the mother of invention", and resource constraints might improve innovative performance. Through a series of experiments, we examine how constraints influence search strategies, and the ultimate performance.

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Saturday, 03:45 PM - 05:15 PM, Holmead East

Track: Service Operations*Session:* Servitization*Chair(s):* Julie Paquette**060-0375** Servitization: Broadening the Definition

Barry Cross, Assistant Professor, Queens University, Canada

Where the term Servitization has generally applied to the product world, we suggest augmenting the definition to include the application of service strategy to traditionally non-service centric environments, which may include service operations where customer service and innovation have not been a priority. That is, a 'service on a service.'

060-0433 Servitization: A Systematic Literature Review

Nikhil Varma, Student, HEC Montreal, Canada

Julie Paquette, Assistant Professor, HEC Montreal, Canada

Rajesh Tyagi, Assistant Professor, HEC Montreal, Canada

The research delves into published articles in the area of Servitization and presents to the research community a "state of the art". The research highlights the strategic intent, environmental mediators and observed outputs by various researches with categorization on the type of service and methodology adopted by researchers.

060-0607 Value Chain Design and Reconfiguration of the Chinese Manufacturer's Product Service Systems: A Case Study

Weijiao Wang, Student, Zhejiang University, China

Yongyi Shou, Associate Professor, Zhejiang University, China

Dmitrij Slepnirov, Associate Professor, Aalborg University, Denmark

This paper selects Hangyang as a paradigmatic case in the context of Chinese manufacturing servitization to explore the transformation and upgrading of manufacturers. The research conducts a comparative analysis on Hangyang's value chains within different product service systems and identifies some important findings concerning servitization.

060-0859 The Value of Capabilities for Service-oriented Strategies

Ornella Benedettini, Assistant Professor, University of Cambridge, United Kingdom

Jane Davies, Assistant Professor, University of Cambridge, United Kingdom

Andy Neely, Professor, Cambridge University, United Kingdom

We investigate the capabilities required by product manufacturers that expand into the service field. Using content analysis to gather data from company reports, we specify service-relevant capabilities within four areas (ecosystem awareness, value proposition, value delivery, accountability spread) and test their relationship with servitization strategy and firm performance.

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Saturday, 03:45 PM - 05:15 PM, Holmead West

Track: General Track*Session:* Operations Management*Chair(s):* Manfredi Bruccoleri**060-0472** Value of Order and Sell through Information in a Multi-echelon Retail Supply Chain

Arunachalam Narayanan, Assistant Professor, University of Houston, United States

Funda Sahin, Associate Professor, University of Houston, United States

Powell Robinson, Professor, University of Houston, United States

Effective inventory management in the upstream echelons of a SC require accurate forecast of downstream demand. In this research, we evaluate the value of POS, sell-through and order data in forecasting demand at each echelon in a retail SC. We present results using data from a large grocery chain

060-0216 Improving SME Competitiveness through Lean: Value Creation and Appropriation Perspective

Erdogan Gülyaz, Student, Nyenrode University, Netherlands

Jack van der Veen, Professor, Nyenrode University, Netherlands

Venu Venugopal, Professor, Nyenrode University, Netherlands

Sam Solaimani, Assistant Professor, Nyenrode University, Netherlands

Lean focuses on creating value while reducing waste. Although frequently overlooked, capturing value is equally important especially for resource-starved SMEs. Drawing on a multidisciplinary literature review of 'customer value' and 'mechanisms of value creation and capture', this paper aims to develop an integrated framework for Lean value management within SMEs.

060-0041 Improving the Inventory Management of Food E-commerce Activities through Darkstores

Pedro Amorim, Lecturer, Faculty of Engineering of University of Porto - INESC TEC, Portugal

Gonçalo Figueira, Reader, Faculty of Engineering of University of Porto - INESC TEC, Portugal

Luis Guimarães, Reader, Faculty of Engineering of University of Porto - INESC TEC, Portugal

Bernardo Almada-Lobo, Associate Professor, Faculty of Engineering of University of Porto - INESC TEC, Portugal

With the growth of the e-commerce retail, its traditional logistic model of picking the SKUs directly from the physical store is being challenged. Using a simulation-optimization approach we design a tailor-made inventory policy for warehouses dedicated to e-commerce (darkstores) that results in a decrease of around 20% of inventory costs.

060-1157 The Role of Leadership in Dampening Groupthink Behavior

Manfredi Bruccoleri, Associate Professor, University of Palermo, Italy

Francesca Riccobono, Student, University of Palermo, Italy

Andreas Größler, Associate Professor, Radboud University Nijmegen, Netherlands

Groupthink behavior plays a threatening role in the quality of decision-making in operational groups. In this paper, we conduct a longitudinal controlled experiment across seventeen 3-month Business Process Reengineering projects to investigate how different characteristics and practices of the leadership within an operational group influence such a negative phenomenon.

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Saturday, 03:45 PM - 05:15 PM, Kalorama

Track: Supply Chain Management

Session: Sustainable Supply Chains 1

Chair(s): Vishal Agrawal

060-0309 The Effect of Sourcing Policies on a Supplier's Sustainable Practices

Vishal Agrawal, Assistant Professor, Georgetown University, United States

Deishin Lee, Assistant Professor, Boston College, United States

We investigate the sourcing decisions of firms who want to source sustainably-produced parts, e.g., organic ingredients, in order to offer sustainable products. We examine how the firm's sourcing policy and competition can influence an upstream supplier's decision to convert to a new sustainable processing standard.

060-0555 Effects of Buyer Safeguards on Prices for New, Used, and Remanufactured Products

Necati Tereyagoglu, Assistant Professor, Georgia Institute of Technology, United States

Ravi Subramanian, Associate Professor, Georgia Institute of Technology, United States

Ramanath Subramanyam, Associate Professor, University of Illinois Urbana-Champaign, United States

Using data from on-line auctions, we explore whether specification of money-back guarantee influences prices differently when sellers have different reputation scores. We also find evidence that the effects of these features vary across new, used, and remanufactured products. Our findings have implications for research on secondary markets and sustainable operations.

060-0678 Inspection and Cooperation in Supply Quality Management

Cuihong Li, Associate Professor, University of Connecticut Storrs, United States

We study a buyer purchasing from a supplier under the concern of quality. The buyer can inspect the incoming units to penalize the supplier for defects, or cooperate with the supplier to improve quality. We consider a general relationship between the buyer's and supplier's quality improvement efforts, allowing them to be complements or substitutes. We identify the structure of the strategy based on the effort relationship and whether the buyer can commit her cooperation effort.

060-0923 Measurement and Improvement of Environmental Performance under Voluntary versus Mandatory Disclosure

Basak Kalkanci, Assistant Professor, Georgia Institute of Technology, United States

Erica Plambeck, Professor, Stanford University, United States

We investigate when a firm should learn, reduce and disclose its impact (accounting for the response from consumers and investors) and whether policy makers should mandate disclosure. Experimentally, we show that voluntary disclosure can boost sales.

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Saturday, 03:45 PM - 05:15 PM, Jay
Session: Sustainable Supply Chains 2
Chair(s): Anna Land

Track: Supply Chain Management

060-0655 Solar Power Photovoltaic Industry Supply Chain Performance

Chuanhui Xiong, Assistant Professor, University of North Carolina Pembroke, United States
 Xiangrong Liu, Assistant Professor, Bridgewater State University, United States

Solar energy, with least negative impacts on the environment, has regained the attention all over the world in the past decade. In this research, we will study the performance of Solar Power Photovoltaic (PV) supply chain by considering three major players as PV manufacturer, PV assembler and consumers.

060-0801 Joint Decisions on Product Carbon Emission and Pricing Considering Heterogeneous Environmental Consumers

Dongfeng Jia, Student, Southeast University, China
 Sijie Li, Associate Professor, Southeast University, China
 Yong He, Professor, Southeast University, China

Under carbon cap and trade regulations, we consider a supply chain which produces newsvendor products with carbon labels and sold in the market filled with consumers of heterogeneous environmental awareness. We propose a revenue sharing contract with low-carbon improvement cost and carbon trade cost to coordinate the decentralized supply chain.

060-1014 Sustainable Supply Chain Management and Dynamic Capabilities: Observations from Food Industry Experts

Anna Land, Student, University of Kassel, Germany
 Stefan Seuring, Professor, University of Kassel, Germany

Through a series of expert interviews (n=27) in Brazilian and German food companies (SMEs and MNCs), the study analyzes the drivers for implementing sustainability measures, mediating variables (e.g. absorptive capacity, risk management, supplier development), and potential outcomes (e.g. capability development, sustainability performance). Results reveal interesting differences, particularly in the motivations.

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Saturday, 03:45 PM - 05:15 PM, Morgan
Session: Models in Supply Chain Management II
Chair(s): Tom Foster

Track: Supply Chain Management

060-0177 Towards an Integrated Model for Supply Chain and Operations

Tom Foster, Professor, Brigham Young University, United States
 Cynthia Wallin, Associate Professor, Brigham Young University, United States

Many universities are transforming operations management programs to more of a supply chain orientation. This paper shows how Brigham Young University has transformed its program into a nationally recognized program by using an integrative model. This model has formed a basis for this nationally recognized global supply chain management program.

060-1035 Dimensions of Supply Chain Management and Maturity: A Interrelationship Theoretical Framework

Guilherme Frederico, Professor, Federal University of Paraná, Brazil
 Jeanfrank Sartori, Student, Federal University of Paraná, Brazil
 Thamires Souza, Student, Federal University of Paraná, Brazil

Since 1990's, researches focused on Supply Chain Management – SCM – have increased in relevance due to its potential to generate opportunities of adding value to the companies and gaining competitive advantage on today's global market. However, there are still lacks in the literature about the dimensions that promote the maturity and success of the SCM and a deeper understanding of their relations. Considering that such knowledge can only be fully achieved through a model that aggregates all known dimensions of the SCM maturity, the present paper is both a systematic literature review of the state of the art of the SCM dimensions and the proposal of a theoretical model that unites all dimensions identified from different authors into a single framework, establishing a classification for them and building concepts of their interrelationship. The main contribution of this paper is a broader model for the SCM, capable of providing a better and deeper understanding of the phenomenon and providing the basis for future research. Furthermore, it aims to sustain future development of tools to help companies improve their abilities to plan, implement and improve SCM in different fields and locations.

060-0208 The Bayesian Optimization Algorithm: The Parent of Genetic Algorithms

Myles Garvey, Student, Rutgers University, United States

Many meta-heuristics exists within the OR literature. Many use a common meta-heuristic known as the genetic algorithm. I will discuss an alternative solution approach, known in the machine learning literature as the Bayesian Optimization Algorithm, and demonstrate its application using the production, inventory, distribution, routing problem (PIDRP) as an exemplar.

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Saturday, 03:45 PM - 05:15 PM, Northwest
Session: Product Decisions, Pricing and Competition
Chair(s): Kostas Bimpikis

Track: Revenue Management and Pricing

060-0359 Market-based Engineering Design

Wenbo Cai, Assistant Professor, New Jersey Inst of Technology, United States
 Yen-Ting Lin, Assistant Professor, University of San Diego, United States
 Edward Huang, Assistant Professor, George Mason University, United States
 Ying-Ju Chen, Associate Professor, Hong Kong University of Science & Tech, Hong Kong

We investigate whether a project manager can set the appropriate pricing schemes for the design teams to maximize the value of the overall design when they have different levels of design outcome uncertainty. We also study the impact of having a multi-echelon organization structure on the overall design outcome.

060-1548 Dynamic Pricing under Competition: The Empirical Study of the Hotel Industry

Alex Nikulkov, Student, Stanford University, United States

Kostas Bimpikis, Assistant Professor, Stanford University, United States

Dynamic pricing can boost profits of a monopolist, but what happens in a competitive market? The ability to change prices gives competing firms more chances to respond to competitor's price changes and could harm profits by intensifying competition. We empirically evaluate the impact of dynamic pricing on firms and consumers.

060-1444 Product and Pricing Decisions in Crowdfunding

Ming Hu, Assistant Professor, University of Toronto, Canada

Xi Li, Student, University of Toronto, Canada

Mengze Shi, Associate Professor, University of Toronto, Canada

We study the optimal product and pricing decisions in a crowdfunding mechanism. Compared to the traditional situation where orders are placed and fulfilled individually, with the crowdfunding mechanism, a product line is more likely than a single product to be optimal and the quality gap between products is smaller.

060-0283 Cournot Competition in Networked Markets

Kostas Bimpikis, Assistant Professor, Stanford University, United States

Shayan Ehsani, Student, Stanford University, United States

The paper considers competition among firms that produce a homogeneous good in a networked environment. A bipartite graph determines which subset of markets a firm can supply to. We characterize equilibrium supply quantities, prices, and profits, and provide several insights regarding entering a new market or two firms merging.

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Saturday, 03:45 PM - 05:15 PM, Oak Lawn

Track: Purchasing and Supply Management*Session:* Buyer-Supplier relationships: New trends and challenges*Chair(s):* Veronica Villena**060-0629** The Impact of Cultural Distance in Contractual Buyer-supplier Relationships

Dina Ribbink, Assistant Professor, University of Western Ontario, Canada

Curtis Grimm, Professor, University of Maryland, United States

Tashfeen Sohail, Associate Professor, Brock University, Canada

Leveraging transaction cost economics, we develop hypotheses regarding the impact of cultural distance on the level of contract completeness, as well as the moderating effects of asset specificity and previous purchase experience. The model is tested using a unique, contractual data set.

060-0725 Risk-sharing Partnerships and NPD Collaboration with Suppliers in Aerospace: Impeding Opportunistic Behavior

Stephan Wagner, Professor, Swiss Federal Institute of Technology Zurich, Switzerland

Stephan Baur, Student, Swiss Federal Institute of Technology Zurich, Switzerland

Risk-sharing partnership is a collaborative model for new product development in aerospace. Based on case studies and data collected at the buyer-supplier dyad, this research identifies the needed prerequisites and enablers as well as an optimal design of the contractual relationship for impeding opportunistic behavior of one party.

060-0358 A Dyadic Theory of Trust in Buyer-supplier Relationships and its Impact on Opportunistic Behavior

Ram Narasimhan, Professor, Michigan State University, United States

Scott DuHadway, Student, Michigan State University, United States

Trust has complicated implications in relationships. This paper develops the concept of trust from a dyadic perspective where incoming trust, outgoing trust, and trust asymmetry play major roles in predicting the performance of a relationship through opportunistic behavior, collaboration, and conflict.

060-1061 Buyer-supplier Embeddedness: An Empirical Examination

Veronica Villena, Assistant Professor, Penn State University University Park, United States

Li Cheng, Student, Penn State University University Park, United States

This research examines the impact of sharing a common third party (e.g., a second-tier supplier) on positive (performance) and negative outcomes by a buyer and supplier. Results are shown in a sample of 288 buyer-supplier relationships

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Saturday, 03:45 PM - 05:15 PM, Columbia 5-8

Track: Meetings & Symposiums*Session:* Practice Leaders Semi-Plenary: Trends in Operations*Chair(s):* Christopher Tang**060-1714** Operations: New Trends from Practitioners' Perspective

ManMohan Sodhi, Professor, Cass Business School, United Kingdom

Nicole DeHoratius, Professor, University of Chicago, United States

This session presents the knowledge and insights obtained by various consulting firms regarding OM from the perspectives of company executives. This session can generate ideas for researchers to explore new OM research areas.

Sessions for Sunday, May 10

Sunday, 08:00 AM - 09:30 AM

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Sunday, 08:00 AM - 09:30 AM, Columbia 1

Track: Behavior in Operations Management

Session: Collaboration, cooperation, coordination

Chair(s): Mei Li

060-0911 Pursuing the Outsourcing Decision Despite Failure: How Escalation and Structure Play a Role

Matthew Castel, Student, Michigan State University, United States

Steve Melnyk, Professor, Michigan State University, United States

Yemisi Bolumole, Assistant Professor, Michigan State University, United States

Roger Calantone, Professor, Michigan State University, United States

This research aims to explore and expand upon the escalation literature by evaluating how differences between the decision maker and implementer influence continuation of a failed outsourcing project. We further will look at how other structural elements may affect escalation behavior in this context.

060-0448 Rewarding Service and Serving Rewards: Complications Emerging from Reciprocity and Responsiveness in Ordering Decisions

Nathan Craig, Assistant Professor, Ohio State University, United States

Elliot Bendoly, Associate Professor, Emory University, United States

Somak Paul, Student, Ohio State University, United States

Recent empirical work has demonstrated that retailers reward their suppliers with a greater share of demand when a higher level of service is rendered. Thus if a supplier improves upon its past service, it may be faced with greater subsequent demand, with the expectation that such higher service is maintained.

060-0156 Intended and Unintended Drivers of Buyer-supplier Collaboration: Strategic Model versus "Trickle-down" Model

Mei Li, Assistant Professor, University of Notre Dame, United States

Thomas Choi, Professor, Arizona State University Tempe, United States

Nada Sanders, Professor, Lehigh University, United States

We empirically examine whether a firm's intra-firm collaborative policy, that is designated to govern the buyer's own employees, might eventually exert more influence than a firm's buyer-supplier collaborative policy on inter-firm collaborative practices. Results support the effects of intra-firm collaborative policy on inter-firm collaboration and on operational outcomes.

060-0645 Strategic Cooperation in Alliance Formation: An Experimental Approach

John-Patrick Paraskevas, Student, University of Maryland, United States

Stephanie Eckerd, Assistant Professor, University of Maryland, United States

Curtis Grimm, Professor, University of Maryland, United States

We explore factors that influence successful outcomes in alliance formation in the presence of asset-specific investments and cooperative agreements. We further investigate potential curvilinear relationships regarding strategic cooperation encouraged under the relational view. In order to conduct our study we employ a behavioral experiment utilizing a prisoner's dilemma setting.

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Sunday, 08:00 AM - 09:30 AM, Columbia 2

Track: Behavior in Operations Management

Session: SC Transformation and Biases in Production decisions

Chair(s): Matthias Ehni

060-1509 A People Based Framework for Lean Implementation at German SME's

Matthias Ehni, Student, Technische Universität Hamburg-Harburg, Germany

Wolfgang Kersten, Professor, Hamburg University of Technology, Germany

The majority of German SME's still apply Lean as a set of methods, not as a holistic approach to train and empower employees for decentralized, target-oriented continuous improvement. This paper aims to fill that gap by developing a holistic implementation-methodology, including evaluation methods and individual suitability, using a qualitative approach.

060-0296 Dynamics of Lean Knowledge Management in Multinational Companies

Stefania Boscari, Student, Università Degli Studi Di Padova, Italy

Pamela Danese, Assistant Professor, Università Degli Studi Di Padova, Italy

Pietro Romano, Associate Professor, Università Di Udine, Italy

A multi-plant lean programme launched by an Italian multinational company with Chinese and US subsidiaries was deeply studied over four years. Our work contributes to debate in the literature by providing a model for network-effective lean practice development and indications on most effective knowledge management approach and mechanisms over time.

060-0969 Green Culture Influence on Environmental Performance: Evidence from Chinese Services Industry

Nachiappan Subramanian, Associate Professor, The University of Nottingham Ningbo China, China

Chong Tao, Student, The University of Nottingham Ningbo China, China

Muhammad Abdulrahman, Assistant Professor, The University of Nottingham Ningbo China, China

Based on institutional theory and human resource management aspects, this study presents a conceptual model which relates green culture and green human resource development factors with green adoption and environmental performance. Using structural equation modeling approach and 225 empirical evidences this study demonstrates Chinese service firms' influential green integration factors.

- 060-0974** Economic View of Planning Fallacy to Determine Realistic Delivery Time
Yamini Srinivasan, Student, Indian Institute of Technology Madras, India
Rahul Marathe, Associate Professor, Indian Institute of Technology Madras, India

Planning fallacy is the tendency to predict an optimistic delivery time to compete in the market place, which may lead to procrastination of delivery of the entire supply chain. To resolve this, we mathematically model a mechanism to reduce the deviation in optimistic prediction and determine a realistic delivery time.

264	Sunday, 08:00 AM - 09:30 AM, Columbia 3	Track: Empirical Research in Operations Management
	Session: Empirical Research - Miscellaneous	
	Chair(s): Necati Ertekin	

- 060-0920** Operations Management and Financing Decisions
Shih-Sian Jhang, Student, University of Buffalo, United States

In the past, operations decisions are presumed to be independent of financing decisions. Using empirical data in US manufacturing and service industry, this research examines how short-term financial factors influence operations management. A dynamic simultaneous equation system is introduced to identify the interaction.

- 060-0897** The Complexity of Multi-media Effects
Ceren Kolsarici, Assistant Professor, Queen's School of Business, Canada
Demetrios Vakratsas, Associate Professor, McGill University, Canada

The authors use Multivariate Adaptive Regression Splines to empirically investigate the revenue implications of multi-media efforts. The results suggests complex, non-linear main and interaction effects and more than 50% inefficiency in total media spending. Finally, interactions are found to further decrease productivity, suggesting antagonistic rather than synergistic cross-media effects.

- 060-0092** Influence of Intellectual Capital on Product and Process Innovations
Jasna Prester, Associate Professor, University of Zagreb, Croatia
Maja Daraboš, Lecturer, Faculty of Business and Economics, Croatia
Davor Filipovic, Lecturer, Faculty of Business and Economics, Croatia

On a large GMRG database containing 761 companies influence of four components of intellectual capital (IC) on product and process innovation are researched using structural equation modeling. Findings show that IC largely influences product innovation, but indirectly also influence processes. Relationships among IC components on innovation activities are researched.

- 060-1279** Key Drivers of Consumer Returns
Necati Ertekin, Student, Texas A&M University College Station, United States
Michael Ketzenberg, Associate Professor, Texas A&M University College Station, United States
Gregory Heim, Associate Professor, Texas A&M University College Station, United States

We study consumer returns at a national jewelry retailer. The annual return rate at this retailer ranges from 8% to 36% across more than 1000 stores. We examine this variation in the context of customer satisfaction and loyalty as it pertains to service quality and product quality.

265	Sunday, 08:00 AM - 09:30 AM, Columbia 4	Track: Retail Operations Management
	Session: Strategic Decision Making in Services	
	Chair(s): Muge Yayla-Kullu	

- 060-0518** Product Line Design and Consumer Behavior Uncertainty
Muge Yayla-Kullu, Assistant Professor, Rensselaer Polytechnic Institute, United States
Jennifer Ryan, Associate Professor, Rensselaer Polytechnic Institute, United States
Jayashankar Swaminathan, Professor, University of North Carolina, United States

We analytically study the effects of consumer behavior uncertainty on the product line decisions of a firm with limited resources. We find that considering resource availability and behavioral uncertainty early on would help firms survive through hard times.

- 060-0821** Leveraging High Fidelity Transaction Data in Managing Retail Operations
Margret Bjarnadottir, Assistant Professor, University of Maryland, United States
Shawn Mankad, Assistant Professor, University of Maryland, United States

Transaction databases are a major source of information for understanding customer behavior. Using tools from data analytics, specifically association rules, latent space models and visualization, we demonstrate how these databases can be used, in conjunction with the traditional revenue data, to target different customer groups and improve retail operations.

- 060-1225** Operations Strategy Framework to Enhance Retail Store Performance
Hasmukh Gajjar, Associate Professor, Indian Institute of Management Indore, India
Bhavin Shah, Associate Professor, Indian Institute of Management Indore, India

This paper explores developing an empirical framework to explore the effect of key determinants of Operations Strategy (e.g. Store image, Store location, Inventory levels, Assortments, Store layout, Staff assistance etc.) on the different measures of Store Performance (Sales per square feet, Sales per employee, Inventory turnover etc.)

- 060-1655** An Integrated Retail Supply Chain Performance Measurement (RSCPM) Model for Indian Retail Sector
Shradha Gawankar, Student, National Institute of Industrial Engineering, Mumbai, India
Sachin Kamble, Associate Professor, National Institute of Industrial Engineering, Mumbai, India

This study provides additional insight into the growing field of the relationships between external internal factors, supply chain management practices, performance measures and supply chain profitability. Governance Structure in form of Contractual and Relation based alliance were used to investigate whether the relationship vary across them.

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| 267 | Sunday, 08:00 AM - 09:30 AM, Columbia 10 | Track: Sustainable Operations |
| | Session: Real-World Implementation of Sustainable Practices | |
| | Chair(s): Vahid Mirzabeiki | |

- 060-1002** Sustainable Development in the Retail Supply Chain Brazilian Fashion: Case Studies
Rita Moro, Student, University of São Paulo, Brazil
Francisca Mendes, Professor, Universidade De Sao Paulo, Brazil
João Amato-Neto, Professor, Universidade De Sao Paulo, Brazil

A wide and varied network of industry makes up the chain of Brazilian fashion retail suppliers, to meet consumers' diverse and differentiated products, making complex the selection of suppliers in relation to social and environmental requirements. It is necessary to study of the adequacy of these requirements.

- 060-0160** Inter-organisational Collaboration for Improving Sustainability Performance of Food Supply Chains
Vahid Mirzabeiki, Assistant Professor, Cranfield University, United Kingdom
Denyse Julien, Senior Lecturer, Cranfield University, United Kingdom
Carlos Mena, Reader, Cranfield University, United Kingdom
Soroosh (Sam) Saghir, Lecturer, Cranfield University, United Kingdom
Michael Bourlakis, Professor, Cranfield University, United Kingdom

"The purpose of this paper is to identify how collaboration of actors of food supply chains can lead to improving the sustainability-related aspects of their operations. The research is conducted through a survey and the data is analysed using Partial Least Squares (PLS) method. This paper is presenting a part of the research conducted through the project Step Change in Agri-Foods Ecosystems (SCALE), funded by INTERREG IVB North-West Europe."

- 060-0193** Motivations for the Adoption of Green IT Practices in a Company - A Case Study of a Call Center
Samuel Moraes, Student, CEETEPS, Brazil
Marcos Crivelaro, Professor, CEETEPS, Brazil

This case study of one Brazilian Call Center, between the twenty biggest, based on international assessment models, aim to understand the motivation to adopt information technology sustainable practices, Green IT. This evaluation occurs among two points of view cost reduction motivation or competitors differentiation.

- 060-0250** Sustainability of Balanced Scorecard: An Analysis in the Context of Brazilian Higher Education Institutions
Tonny Rodrigues, Associate Professor, Federal University of Rio De Janeiro, Brazil
Átila Lira, Associate Professor, Faculdade Santo Agostinho, Brazil
Irenilza Nääs, Professor, UNIP, Brazil
Daniel Oliveira, Student, Faculdade Santo Agostinho, Brazil

It is noticed that the Brazilian HEIs feel enormous difficulties in maintaining sustainable competitive advantages when achieved through still little known businesses strategies or used in the national context as the BSC. We propose the following question: how to make the BSC a sustainable strategy in the context of Brazilian.

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| 268 | Sunday, 08:00 AM - 09:30 AM, Columbia 11 | Track: Sustainable Operations |
| | Session: Impact of Policies and Reporting Requirements | |
| | Chair(s): Martin Schleper | |

- 060-0587** Why Do Firms Incorporate Standards and Codes?
Felix Tuczek, Student, Vienna Univ of Econ & Business Admin, Austria
Tina Wakolbinger, Professor, Vienna Univ of Econ & Business Admin, Austria

Competing theories can be found in the literature concerning the impact of standards and codes on company performance. The purpose of this literature review is to condense existing surveys in order to gain a holistic overview on the effects of standards and codes in the domain of sustainability.

- 060-0130** Conditioning Factors on the Performance of Eco-innovation Projects and the Influence of Public Policies
Vanessa Pinsky, Student, Universidade De Sao Paulo, Brazil
Isak Kruglianskas, Professor, Universidade De Sao Paulo, Brazil

The qualitative research analyzes cases of multinationals companies in different sectors in Brazil: consumer goods, sugarcane, chemical, transportation and financial services. The main contribution is focused on how different public policy instruments and institutional environments are driving corporate innovation focus on the development of a low carbon economy.

- 060-0137** Sustainability Reporting Revised - Incorporating Supply Chain Management, Capabilities, and Materiality
Thomas Kjaergaard, Student, Aarhus University, Denmark
Martin Schleper, Lecturer, EBS University for Business and Law, Germany
Christoph Schmidt, Student, EBS University for Business and Law, Germany
Kai Foerstl, Professor, EBS University for Business and Law, Germany

Sustainability reporting still lacks focusing on leading and supply chain indicators. Based on Absorptive Capacity and by applying content analysis and case studies, we identify both compliance- and competitiveness-oriented best practices for sustainable supply chain management in the context of reporting.

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| 270 | Sunday, 08:00 AM - 09:30 AM, Piscataway | <i>Track:</i> Inventory Management |
| | <i>Session:</i> New results in classical inventory management problems | |
| | <i>Chair(s):</i> Fang Liu | |

- 060-0368** Pooling and Dynamic Allocation Policies to Deliver Differentiated Service
Yuanguang Zhong, Assistant Professor, South China University of Technology, China
Zhichao Zheng, Assistant Professor, Singapore Management University, Singapore
Mabel Chou, Associate Professor, National University of Singapore, Singapore
Chung-Piaw Teo, Professor, National University of Singapore, Singapore

We study the inventory pooling problem with heterogeneous service level requirements from different customers. Using Blackwell's Approachability Theorem, we derive a set of necessary and sufficient conditions on the optimal inventory level. We extend our model to analyze the benefits of pooling and dynamic allocation in a general supply network.

- 060-0851** Optimal Policies for Inventory Systems with a Limited Number of Replenishments
Onur Kilic, Assistant Professor, Hacettepe University, Turkey
Remco Germs, Assistant Professor, Wageningen University, Netherlands

We study a \square finite-horizon stochastic inventory system with an upper bound on the number of replenishments. We demonstrate several structural properties of the problem and also introduce a novel functional property "K-convex dominance". These enable us to show that the optimal control policy is a state-dependent (s,S) policy.

- 060-1405** Managing Inventory of Perishable Products in Multiple Locations
Yun Fong Lim, Associate Professor, Singapore Management University, Singapore
Fang Liu, Assistant Professor, Nanyang Technological University, Singapore

We consider a retailer selling multiple perishable products with random demands over a single season. We study the retailer's optimal decisions in each of the three stages of her decision process: (1) the ordering stage, (2) the storage stage, and (3) the retrieval stage.

- 060-1451** Closed-form Approximations for Optimal (r,q) and (S,T) Policies in a Parallel Processing Environment
Macus Ang, Lecturer, Singapore University of Technology and Design, Singapore
Karl Sigman, Professor, Columbia University, United States
Jing-Sheng Song, Professor, Duke University Durham, United States
Hanqin Zhang, Professor, National University of Singapore, Singapore

We consider (r, q) and (S, T) systems with i.i.d. stochastic leadtimes and establish closed-form expressions for optimal policies and costs in heavy traffic limit. In the limit, the well-known square root relationship between the optimal order quantity and demand rate is replaced by the power of 1/3.

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| 271 | Sunday, 08:00 AM - 09:30 AM, Cardozo | <i>Track:</i> Information in Operations Management |
| | <i>Session:</i> Emerging Issues in E-business | |
| | <i>Chair(s):</i> Dengpan Liu | |

- 060-0736** The Power of Silence: An Analysis of the Reporting Bias in User-generated Contents
Hongyu Chen, Assistant Professor, California State University Long Beach, United States
Eric Zheng, Associate Professor, University of Texas Dallas, United States
Yasin ceran, Assistant Professor, Santa Clara University, United States

User-generated contents (UGC) such as online reviews are inherently incomplete since we do not capture the opinions of users who do not write a review. These silent users may be systematically different than those who speak up. We develop a method to model user's UGC generating process then rectify this bias.

- 060-0840** Investigating the Impact of Referral Channels on E-commerce Site Performance
Wenjing Duan, Associate Professor, George Washington University, United States
Jie Zhang, Associate Professor, University of Texas Arlington, United States

This study scrutinizes the predictive relationship between three referral channels --- search engine, social media, and third-party advertising --- and e-commerce website performance. Our results derived from vector autoregressive models suggest a significantly differential predictive relationship between referrals from the three channels and sales performance measures.

- 060-0944** On the Value of Social Friendship Network in P2P Microloan Risk Control
Sirong Luo, Associate Professor, Shanghai University of Finance and Economics, China

Dengpan Liu, Associate Professor, Iowa State University, United States

The P2P Microloan service has been rapidly growing in recent years. Because of the lack of historical data and high risk customers, the traditional credit risk models in banking industry have limitations. Motivated by this, we empirically investigate whether the social network information can help the risk control.

060-1240 Crowdsourcing Exploration

Yiagos Papanastasiou, Student, London Business School, United Kingdom

Kostas Bimpikis, Assistant Professor, Stanford University, United States

Nicos Savva, Assistant Professor, London Business School, United Kingdom

In an online review platform, information on the quality of alternative service providers is both generated and utilized by self-interested consumers. We investigate the problem of designing optimal information-provision policies, when the platform's goal is to maximize aggregate consumer surplus.

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Sunday, 08:00 AM - 09:30 AM, Du Pont

Track: Humanitarian and Not-for-profit Operations

Session: The issues of information, personnel and material convergence in disaster response

Chair(s): Miguel Jaller Jose Holguin-Veras

060-1025 Managing Volunteer Convergence at Disaster Relief Centers

Emmett Lodree, Associate Professor, University of Alabama Tuscaloosa, United States

Lauren Davis, Associate Professor, North Carolina A&T State University, United States

Robert Cook, Student, University of Alabama Tuscaloosa, United States

Relief centers are the part of the disaster response supply chain that serve the same purpose as retailers in commercial supply chains. One of the challenges of managing relief centers is volunteer convergence. This study investigates the effectiveness of various volunteer assignment policies in the relief center context.

060-0865 Low- and Non-priority Donations: Why People Donate Not Required Items? A Psychological Perspective on Donations

Paula Repetto, Associate Professor, Pontificia Universidad Catolica De Chile, Chile

Based on the psychology literature we discuss four hypothesis that may contribute to explain donation behavior during disasters. These are: previous donation behavior explains current behavior; there are no bad donations; imperfect altruism and emotional benefits of giving; and influence of contextual factors (peer behavior, relationship between donor, beneficiary, donation).

060-1259 The Thought That Counts: Motivations for Giving to Disaster Relief

Samantha Penta, Student, University of Delaware, United States

Mary Nelan, Student, University of Delaware, United States

Tricia Wachtendorf, Associate Professor, University of Delaware, United States

This research employs interviews to examine motivations among donations drive organizers for participating in disaster relief within the United States. Data indicate organizers participate for multiple reasons beyond a desire to help survivors, including several donor-focused motivations targeted at meeting donor wants and objectives, often independent of survivor needs.

060-1348 Material Convergence after Hurricanes Katrina and Sandy

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

Johanna Amaya, Student, Rensselaer Polytechnic Institute, United States

Miguel Jaller, Assistant Professor, University of California Davis, United States

Felipe Aros-Vera, Reader, Rensselaer Polytechnic Institute, United States

This presentation discusses and compares the findings from the research conducted by the authors on the problem of material convergence in the United States after two major disasters: Hurricane Katrina in the Gulf coast and Hurricane Sandy in the North-East coast. Suggestions for improvement of future response efforts are provided.

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Sunday, 08:00 AM - 09:30 AM, Embassy

Track: Humanitarian and Not-for-profit Operations

Session: Building Social Capital for Humanitarian and Non-for-Profit Operations

Chair(s): Miguel Jaller

060-0287 Community-driven Logistic Structures: Impacts on Efficient and Effective Recovery Operations

Jennifer Bealt, Student, Brunel University, United Kingdom

Afshin Mansouri, Senior Lecturer, Brunel University, United Kingdom

This research explores the ways in which alternative logistics structures, generated through community efforts can support recovery after disasters. Specifically we focus on Collaborative Aid Networks (CANs) as drivers of efficient and effective recovery. A conceptual framework is presented in order to further understand how communities support logistics activities.

060-0831 S3P Stakeholder Relationship Model

Tharciso Fontainha, Student, Pontifica Universidade Catolica Do Rio De Janeiro- Puc Rio, Brazil

Adriana Leiras, Assistant Professor, Pontifica Universidade Catolica Do Rio De Janeiro- Puc Rio, Brazil

Renata Bandeira, Assistant Professor, Pontifica Universidade Catolica Do Rio De Janeiro- Puc Rio, Brazil

The paper identifies the main stakeholders involved in disaster response operations, proposing an interaction model about their relationships. A quantitative and qualitative discussion about their relationship is presented, based on the results of an academic systematic literature review. Their results indicate a disproportionate emphasis on the different relationships.

060-1203 Local Organizations Response in Disaster: A Case Study of a Successful Response to the Needs of the Community
Paula Repetto, Associate Professor, Pontificia Universidad Catolica De Chile, Chile

We studied a cultural non-profit organization that provided aid in the Valparaiso wildfire, April 2014. We examined how they organized the delivery of aid to 100+ families and defined the needs of these families. We discuss the lessons learned aiming to understand the needs of people exposed to disasters.

060-1333 Social Capital in Areas Affected by Natural Disasters and Armed Conflict: The Case of Colombia
Miguel Jaller, Assistant Professor, University of California Davis, United States
Christopher Mejía-Argueta, Academic Leader, Logyca, Colombia
Juan Sanchez, Student, Universidad de Antioquia, Colombia

Recent studies indicate that social networks arising from social capital have a significant role in humanitarian operations. However, there are specific conditions that could impact the social capital. Considering the Colombian case, this presentation discusses the relationship between social capital and armed conflict in doubly-affected-areas (natural disaster and conflict).

060-1342 Collaborative Aid Networks: The Importance of Integration with the Local Social Fabrics
Jose Holguin-Veras, Professor, Rensselaer Polytechnic Institute, United States
Miguel Jaller, Assistant Professor, University of California Davis, United States

This presentation discusses the strengths and weaknesses of different logistics structures identified after the Haiti disaster: Agency Centric Efforts, Partially Integrated Efforts, and Collaborative Aid Networks. These structures differ to the extent to which they are integrated with the local social networks and structures during the relief effort.

274	Sunday, 08:00 AM - 09:30 AM, Fairchild East	<i>Track:</i> Healthcare Operations Management
	<i>Session:</i> Health care supply chain performance issues	
	<i>Chair(s):</i> WC Benton	

060-1090 Planning, Implementation, and Use of Healthcare Information Technology
Anand Nair, Professor, Michigan State University, United States
David Dreyfus, Student, Michigan State University, United States

This study investigates how the scope of information technology plan impacts the ability of hospitals to meaningfully use technology. The paper examines the antecedent role of length of planning horizon, team engagement, and top management involvement on the scope of IT plan.

060-1685 A Case Study of a 2-bin RFID Enabled System Deployment to Improve Hospitals' Supply Chain Visibility and Efficiency
Simon Veronneau, Associate Professor, Naval Postgraduate School, United States
Jacques Roy, Professor, Hec Montreal, Canada
Sylvain Landry, Professor, Hec Montreal, Canada

The following case study looks at a 2-bin RFID enabled Kanban system in three hospitals. The system goal was to increase manager visibility, reduce inventory costs, reduce stockouts. Results shows that while visibility is increased, cost saving and efficiency depends largely on management ability to properly deploy the system.

060-1162 Environmental Sustainability Activities of Hospitals in the United States
Henry Aigbedo, Associate Professor, Oakland University, United States

Many hospitals are involved in environmental sustainability initiatives. In this exploratory study, we use a sample of US hospitals to examine characteristics of these initiatives. Based on available data, we also assess how well they are doing.

060-1218 Identifying Quality Gaps and Their Impact in Healthcare
Sehwon Kang, Student, University of Minnesota, United States
Rachna Shah, Associate Professor, University of Minnesota, United States

Although hospitals strive to achieve high quality and cost efficiency, many struggle to sustain both simultaneously. This research focuses on how each element interacts each other to create a combined effect on patient satisfaction. One major finding is the effect of experiential quality on patient satisfaction is moderated by cost.

275	Sunday, 08:00 AM - 09:30 AM, Fairchild West	<i>Track:</i> Global Operational Issues
	<i>Session:</i> Global Operations Network and Development Strategy	
	<i>Chair(s):</i> Vernon Hsu	

060-0591 Linkages between Network Capabilities and Manufacturing Network Coordination: An Exploratory Study
Steffen Mengel, Student, University of St. Gallen, Switzerland
Richard Luetzner, Student, Universitat St. Gallen, Switzerland
Thomas Friedli, Associate Professor, University of St. Gallen, Switzerland

Following a case study research procedure, we investigated four business units of a multinational corporation to identify the link between network capabilities (Shi and Gregory 1998) and the network's strategic coordination (i.e. degree of centralization and standardization), to develop a descriptive model of linkages between network capabilities and infrastructural levers.

060-0993 The Impact of Product Architecture on the Design of Global Operations Networks

Jan Olhager, Professor, Lund University, Sweden

We investigate how decisions on product architecture (modular and integral designs) impact the design of global operations networks. We use a multiple-case study of eleven product groups from three large global manufacturing corporations.

060-0592 Responsiveness and Efficiency in Multinational Companies – Shared Factories as an Option for Foreign Market Entries

Richard Luetzner, Student, Universitat St. Gallen, Switzerland

Steffen Mengel, Student, University of St. Gallen, Switzerland

Thomas Friedli, Associate Professor, University of St. Gallen, Switzerland

Based on single case study research, we propose a shared factory concept as construct for foreign market entries where one division of a multinational corporation already operates a site in the target market of a second division. The latter benefits from low initial investments, the prior from shared fixed costs.

060-0575 Foreclosure or Not? A Multinational Firm's Foreclosure Decision and Its Rival's Strategic Sourcing Problem

Vernon Hsu, Professor, Chinese Univ of Hong Kong, Hong Kong

Jiayan Xu, Student, Chinese Univ of Hong Kong, Hong Kong

Inspired by the practice that many multinational firms (MNFs) position parts of their supply chains in tax heavens to improve post-tax profits by transfer pricing, we study the foreclosure decision (i.e., whether provide input to a downstream rival) of a MNF, whose upstream division is located in a low-tax region.

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Sunday, 08:00 AM - 09:30 AM, Gunston East

Track: Production Planning and Scheduling

Session: Robustness and Flexibility in Scheduling

Chair(s): Philippe Chevalier

060-0778 Robust Planning in a Make-to-Stock Production–inventory Workshop

Jose Antonio Heredia Alvaro, Associate Professor, Universitat Jaume I, Spain

Antonio Estruch, Assistant Professor, Universitat Jaume I, Spain

Nico Vandaele, Professor, Katholieke Universiteit Leuven, Belgium

This paper presents a robust planning algorithm to hedge the manufacturing system against disturbances. For a simple real case, the solution obtained with the method proposed is compared with the deterministic approach solution used in practice. The information model based on industry standards is also introduced.

060-0242 Evaluating the Logistical Performance of Production Segmentation

Christina Reuter, Senior Lecturer, RWTH Aachen University, Germany

Annika Hauptvogel, Assistant Professor, Laboratory for Machine Tools and Production Engineering (WZL), Germany

Melanie Luckert, Assistant Professor, Laboratory for Machine Tools and Production Engineering (WZL), Germany

Production segmentation is a method to increase logistical performance by combining the advantages of shop fabrication and production lines. In this paper, an approach for evaluating the potential logistical performance of segmentation variants is presented. Therefore a characteristic curve based on simulation studies is proposed.

060-1345 Capacitated Disassembly Scheduling with Parts Commonality and Start-up Cost

Xiaocong Ji, Student, Tsinghua University, China

Zhihai Zhang, Associate Professor, Tsinghua University, China

Simin Huang, Professor, Tsinghua University, China

Lefei Li, Associate Professor, Tsinghua University, China

We consider capacitated disassembly scheduling with parts commonality and start-up cost arisen from remanufacturing and many production systems. A Lagrangian heuristic is developed to solve the proposed MIP model. Numerical study reveals that the approach outperforms CPLEX significantly. Valve disassembly and ethylene production cases are conducted which provides useful insights.

060-1072 Identification of Alternative Assembly Sequences for Large-scale Products

Torben Schmitz, Assistant Professor, Rwth Aachen University, Germany

Christina Reuter, Senior Lecturer, RWTH Aachen University, Germany

Peter Burggräf, Associate Professor, Rwth Aachen University, Germany

Philip Rochow, Associate Professor, IPH Hanover, Germany

Henrik Prinzhorn, Assistant Professor, IPH Hanover, Germany

Johannes Wagner, Assistant Professor, Rwth Aachen University, Germany

Assembling large-scale products involves frequent process interruptions induced by e.g. delayed material deliveries or missing availability of resources. Our approach for identifying alternative assembly sequences by analyzing the product structure and process dependences allows for continuing with an assembly process in case of interruptions and therefore increases the process efficiency.

060-1297 Taking Forecast Reliability into Account for Scheduling

Philippe Chevalier, Professor, UC Louvain, Belgium

Wenli Peng, Student, UC Louvain, Belgium

In order to meet service level constraints, some slack must be included in the scheduled delivery time. This slack will be sequence dependent. We present a sequencing heuristic to minimize the expected accounts receivables linked to the production.

Sunday, 08:00 AM - 09:30 AM

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Sunday, 08:00 AM - 09:30 AM, Gunston West

Track: Marketing and OM Interface

Session: Promotion and Pricing

Chair(s): Changseung Yoo

060-0760 Optimal Ordering and Markdowns for an Innovating Firm with Strategic Consumers

Tianxiao Gong, Student, Peking University, China

Lihua Chen, Professor, Peking University, China

Zhaowei Hao, Student, Peking University, China

In the electronic or other high-tech markets, strategic consumers may delay their purchase for new generation or the markdown of the current one. In a game-theoretical model, we show the equilibrium exists between strategic consumers and the innovating firm and obtain the optimal inventory and markdowns decisions.

060-0893 Profitability of Restricted Redemptions in Loyalty Program

Amirhossein Bazargan, Student, Ryerson University, Canada

Salma Karray, Associate Professor, University of Ontario Institute of Technology, Canada

Saeed Zolfaghari, Professor, Ryerson University, Canada

A widely used feature of loyalty programs consists in imposing a specific number of purchases before customers can redeem their points. We develop and solve a dynamic stochastic Nash game using a consumer-based utility model to study whether restricting redemption is profitable, and if so under which conditions.

060-0521 Equilibrium Pricing and Advertising Mix in Dynamic Oligopoly Markets

Genaro Gutierrez, Associate Professor, University of Texas Austin, United States

Changeung Yoo, Student, University of Texas Austin, United States

We analyze a multi-firm pricing and advertising model in a dynamic oligopoly market. We show that, under a set of assumptions, the equilibrium price and various advertising effort decision variables are monotonic in the brand awareness level, and that the value function corresponding to the equilibria exhibits strategic complementarities.

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Sunday, 08:00 AM - 09:30 AM, Coats

Track: Economics Models of Operations

Session: Managing Incentives in Technology Supply Chains

Chair(s): Sreekumar Bhaskaran

060-0820 The Role of Decision Rights in Collaborative Development Initiatives

Vishal Agrawal, Assistant Professor, Georgetown University, United States

Nektarios Oraiopoulos, Assistant Professor, Cambridge University, United Kingdom

In this paper, we study initiatives for co-development of new products and technologies. In such settings, it may be difficult a priori to specify contracts contingent on the outcome. Therefore, we investigate the efficacy of different contractual structures, which instead specify the decision-making process.

060-0824 Orders and Reciprocity in the Technology Supply Chain

Heejong Lim, Student, Purdue University, United States

Ananth Iyer, Professor, Purdue University, United States

Motivated by the semiconductor and the LCD industry, we incorporate the reciprocal game in a dyadic supply channel. The buyer's anticipated reciprocal behavior influences the seller's order so as to protect the seller during the oversupply period. We provide an analysis under different level of reciprocity following accepted economic models.

060-0952 Preannouncement Strategies for Competing Platforms in Two Sided Markets

Rajiv Mukherjee, Assistant Professor, Southern Methodist University, United States

Ramnath Chellappa, Associate Professor, Emory University, United States

We study commitment levels in preannouncement strategies for horizontally differentiated competing platforms with two sided markets of users and developers. We examine the impact of same and cross side network effects of such competing platforms's pricing and licensing strategies on its users and developers.

060-1473 The Value of Competition in Remanufacturing

Narendra Singh, Student, Georgia Institute of Technology, United States

Karthik Ramachandran, Associate Professor, Georgia Institute of Technology, United States

Ravi Subramanian, Associate Professor, Georgia Institute of Technology, United States

We study an OEM's product strategy when the OEM offers a new product that depreciates over time. The OEM competes with a third-party remanufacturer for acquisition and remanufacturing of the depreciated products. We show that competition from the third-party remanufacturer in the presence of strategic consumers can benefit the OEM.

279

Sunday, 08:00 AM - 09:30 AM, Monroe

Track: Product Innovation and Technology Management

Session: Implications of Modularity and Mass Customization on Innovation

Chair(s): Debasish Mallick

060-1120 Managing Product Variety in Turbulent Environments

Alex Alblas, Assistant Professor, Eindhoven University of Technology, Netherlands

Jayanth Jayaram, Professor, University of South Carolina, United States

Product platforms have predefined modularity with standardized interfaces. However, in the context involving advanced technologies, these interfaces are not mature at the product design stage. Using an empirical study of 24 projects in microlithography machinery manufacturing, this paper examines the interrelationships among project context, platform modeling, and success.

060-1370 About the Relevance of Modularity

Wolfgang Kersten, Professor, Hamburg University of Technology, Germany

Henning Skirde, Student, Hamburg University of Technology, Germany

Birgit von See, Student, Hamburg University of Technology, Germany

Maren Wichmann, Student, Hamburg University of Technology, Germany

One major industrial challenge is to provide a high variety of products and services to fulfill customer needs. The application of modularity enables companies to offer the required external complexity while limiting the effects on cost and reliability internally. We show how to derive modular structures and exemplify the results.

060-1563 Visualizing Interfirm Relationship Formation Sequences in Converging Business Ecosystems

Rahul Basole, Associate Professor, Georgia Institute of Technology, United States

Analogous to DNA sequencing in the biological sciences, this research determines and then visualizes the order of an organization's interfirm activities using six canonical relationship bases (strategic, marketing, R&D, licensing, manufacturing, supply chain). We demonstrate our sequencing method with an illustration of firms in the converging ICT ecosystem.

060-1568 Product Modularity and NPD Performance: Effect of Supplier Involvement and Mass Customization Capability

Sohel Ahmad, Associate Professor, St. Cloud State University, United States

Debasish Mallick, Associate Professor, University of St. Thomas, United States

Roger Schroeder, Retired, University of Minnesota, United States

We present an integrated framework to study the relationship between product modularity, supplier involvement, mass customization capability and overall NPD performance. We also test the framework empirically with the data collected from 242 NPD projects from three industries

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Sunday, 08:00 AM - 09:30 AM, Holmead East

Track: Service Operations

Session: Economics of queues

Chair(s): Laurens Debo

060-0075 Efficient Ignorance: Information Heterogeneity in a Queue

Ming Hu, Assistant Professor, University of Toronto, Canada

Yang Li, Student, University of Toronto, Canada

Jianfu Wang, Assistant Professor, Nanyang Technological University, Singapore

We consider a queue with a stream of mixed informed and uninformed customers. We show that some amount of information ignorance about the real-time queue length in the population can lead to strictly higher social welfare than information homogeneity with completely full or no information.

060-0170 Pricing Lead-Times with Customer Choice: Apparent Loss and Welfare

Michael Pavlin, Assistant Professor, Wilfrid Laurier University, Canada

This paper addresses the implementation of price-lead time menus for congested service providers. We define apparent loss: the difference between current and optimal revenue at current prices. We study its relation to welfare and its application as a heuristic for guiding dynamic pricing algorithms.

060-0480 Trading Time in a Congested Environment

Luyi Yang, Student, University of Chicago, United States

Laurens Debo, Associate Professor, University of Chicago, United States

Varun Gupta, Assistant Professor, University of Chicago, United States

Heterogeneous time-sensitive customers with private information about their delay costs trade their waiting positions in a queue through a profit-maximizing broker. We find that the broker's optimal mechanism would restrict trading among a pool of customers with moderate delay costs. We propose a simple auction to implement the optimal outcome.

060-0929 Optimal Pricing and Contract Problems of a Website with Advertising Revenue

Yanju Zhou, Professor, Central South University, China

Zhen Shen, Student, Central South University, China

Considering the more and more highlighted value of online advertise on website's revenue, we study the optimal decisions for a website, who has different profit models and pricing mechanisms, when the advertiser has private information about his ability to pay for advertisements. Several important influence factors also be identified.

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Sunday, 08:00 AM - 09:30 AM, Holmead West

Track: Service Operations

Session: Innovative Strategies to Improve Service Quality

Chair(s): Getulio Akabane

060-0574 Impact of the Variability in Service Quality

Namkyung Lee, Student, Korea University, Korea, Republic of (South Korea)

Hojung Shin, Professor, Korea University, Korea, Republic of (South Korea)

Research on the variability in service quality has been scarce while much attention has been paid to the variability in product quality. This study examined the impact of quality variability in service field by identifying the mechanism through which the variability has an effect on repurchase intentions.

060-0637 An Analysis of Road Maintenance Cost Savings by Sharing Coast Transport in Long Haul Transportation

Denilson Carvalho, Student, CEETEPS, Brazil

Karla Cañete, Professor, SESC/CEETEPS, Brazil

Fernando Tassinari, Professor, CEETES/SESC, Brazil

Getulio Akabane, Retired, CEETEPS, Brazil

Antonio Galhardi, Professor, CEETEPS, Brazil

This study aims to evaluate road maintenance cost reduction by sharing coast transport modal for long haul transportation. The average traffic frequency was raised with concessionaires and government. In this sense, coast transportation was evident as viable and share modal alternative in order to pursuit operational sustainability.

060-1382 The Impact of Online Review Management Strategies on Service Operations

Ying Fan, Assistant Professor, University of Colorado Colorado Springs, United States

Run Niu, Assistant Professor, Webster University, United States

Customers' purchasing intentions are increasingly influenced by online reviews. The reviews provide invaluable resources for businesses to get customer feedback and monitor service quality. The study surveys companies listed in local convention and visitor bureau in popular destinations nationwide. We investigate how businesses utilize online reviews to improve service operations.

060-0870 Investment Strategies in Operational Risk Management

Yuqian Xu, Student, New York University, United States

Jawei Zhang, Associate Professor, New York University, United States

Michael Pinedo, Professor, New York University, United States

This paper considers several budget allocation models for analyzing investment strategies in banks with the goal of minimizing expected losses due to Operational Risk. We hereby propose a new way of studying operational risk and provide new insights into guidelines for the operational risk regulation of banks.

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Sunday, 08:00 AM - 09:30 AM, Kalorama

Track: Supply Chain Management

Session: Issues in Global Supply Chain Management

Chair(s): Michael Ketzenberg

060-0774 Exploring Network Market Structures of Intermodal Freight Transportation Chains

Rob Zuidwijk, Professor, Erasmus University Rotterdam, Netherlands

Hamid Saeedi, Student, Delft University of Technology, Netherlands

Bart Wiegman, Lecturer, Delft University of Technology, Netherlands

Intermodal freight transportation services in a chain compete on a variety of markets. Terminals operators offer transshipment services in a region, freight forwarders offer transportation services along routes between origins and destinations, etc. This paper proposes an integral study of these markets using network theory and market concentration indices.

060-1555 Supply Chain Integration: A Qualitative Perspective

Anto Verghese, Associate Professor, Texas Christian University, United States

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

Morgan Swink, Professor, Texas Christian University, United States

Supply chain integration (SCI) is conceptually and empirically confounded with coordination, and collaboration. This makes the empirical results obtained through the existing conceptualization of SCI suspect. We employ a qualitative approach to identify and define the different nuances of SCI, and create a taxonomy comprising of its behaviors/practices.

060-1554 Product Recalls and Supply Chain Efficiency: Evidence from the Meat and Poultry Industry

Gary Gaukler, Associate Professor, Drucker School of Management, Claremont Graduate University, United States

Vijaya Chebolu-Subramanian, Assistant Professor, Institute of Financial Management and Research, India

Through an empirical analysis of over 500 recalls, we identify key factors that impact the food product recall process in food supply chains. In particular, we investigate how the supply chain structure affects the efficiency and effectiveness of recalls. We also comment on the impact of traceability and condition monitoring.

060-1462 Offshoring or Onshoring: Examination of Global Sourcing by U.S. Manufacturers

Jian-yu Ke, Assistant Professor, University of Wisconsin, United States

Chaodong Han, Assistant Professor, Towson University, United States

Woohyun Cho, Assistant Professor, University of New Orleans, United States

By including external economic factors, our model shows what factors drive a US manufactures to offshore or onshore. Further, our results show what makes a firm's onshore become more or less successful. Managerial implications are discussed.

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Sunday, 08:00 AM - 09:30 AM, Jay

Track: Scheduling and Logistics*Session:* Distribution in Competitive Environments*Chair(s):* Sara Saberi**060-0635** Metaheuristics for a Supply Chain Scheduling Problem with Delivery Splitting

Ramakrishna Govindu, Lecturer, University of South Florida, United States

Anurag Agarwal, Professor, University of South Florida, United States

We look at a supply chain scheduling problem involving a single supplier and multiple customers for similar but not identical products. The customers are assumed to be in close geographical proximity. The objective is to minimize the penalty for late deliveries. We propose and compare several heuristics and metaheuristic approaches.

060-0040 Stackelberg Competition in the Time-definite Less-than-Truckload Industry

Cheng-Chang Lin, Professor, National Cheng Kung University, Taiwan, Republic of China

Jian-Ching Chen, Student, National Cheng Kung University, Taiwan, Republic of China

The industry consolidates and delivers time-sensitive small shipments for shippers. Under the Stackelberg competition the leader best estimates followers' reaction functions and determines the market price to maximize its own profit under the notation that the followers are price takers. Numerical results of Nash and Stackelberg games will be presented.

060-0214 Big Data in Logistics: The UK Experience

Ramakrishnan Ramanathan, Professor, University of Bedfordshire, United Kingdom

Yanqing Duan, Professor, University of Bedfordshire, United Kingdom

Elly Philpott, Senior Lecturer, University of Bedfordshire, United Kingdom

Usha Ramanathan, Senior Lecturer, University of Bedfordshire, United Kingdom

Main objective of this study is to investigate the use of big data in UK logistics and to explore relevant theory. A value creation approach using the input-output transformational framework has been employed. The framework and theoretical underpinnings have been tested by conducting interviews and collecting empirical data.

060-0378 Supply Chain Network Competition in Price and Quality with Multiple Manufacturers and Freight Service Provider

Anna Nagurney, Professor, University of Massachusetts Amherst, United States

Sara Saberi, Student, University of Massachusetts Amherst, United States

Shivani Shukla, Student, University of Massachusetts Amherst, United States

Jonas Floden, Senior Lecturer, University of Gothenburg, Sweden

We develop multitiered static and dynamic supply chain network models with manufacturers and freight service providers competing on price and quality. An algorithm tracking the evolution of the strategic variables over time through discrete-time adjustment is presented. The framework is illustrated numerically and its practicality demonstrated.

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Sunday, 08:00 AM - 09:30 AM, Morgan

Track: Supply Chain Management*Session:* Models in Supply Chain Management III*Chair(s):* Dean Chatfield**060-1054** Supply Chain Driven Innovation in Emerging Countries

Veronica Paula, Professor, Uberlandia Federal University, Brazil

Wendy Tate, Associate Professor, University of Tennessee Knoxville, United States

Verica Paula, Assistant Professor, Uberlandia Federal University, Brazil

Customer input is driving every innovation aspect: product concept, launch timing, packaging, delivery. In this demand-driven innovation scenario, supply chain must respond directly to customer needs, although they are continually shifting. It must be cost effective, efficient, constantly decreasing lead-times. This research focuses on supply chain driven innovation in Brazil.

060-1027 Conceptualizing Resilience amid Supply Chain Risk: An Organizational Behavior Perspective

Canan Kocabasoglu Hillmer, Senior Lecturer, Cass Business School, United Kingdom

Michael Braunscheidel, Associate Professor, Canisius College, United States

James Hamister, Associate Professor, Wright State University, United States

The purpose of this study is to understand and provide a conceptual development of resilience as a response to various supply chain risks that are categorized as known unknowns vs. unknown unknowns. In conceptualizing resilience, this study will build upon the work of Weick and Sutcliffe (2001).

060-1235 Incorporating Order Crossover Information into Service-focused Base Stock Policy Decisions

Dean Chatfield, Associate Professor, Old Dominion University, United States

Alan Pritchard, Student, University of Maryland, United States

We perform a simulation-based study of ways order crossover information can be utilized when setting safety stock in an (R,S) inventory system with a service level target. Issues related to effective lead times, the use of the normal approximation, and the appropriate protection period are investigated.

Sunday, 08:00 AM - 09:30 AM

285	Sunday, 08:00 AM - 09:30 AM, Northwest	Track: General Track
	Session: Designing and Teaching the OM Core Course Workshop Part I – Content, Scope, and Positioning	
	Chair(s): Joel Goldhar Arthur Hill	

060-0324 Designing and Teaching the OM Core Course Workshop Part I – Content, Scope, and Positioning

Arthur Hill, Professor, University of Minnesota, United States

Joel Goldhar, Professor, Illinois Institute of Technology, United States

This first of two OM Core Course workshops will focus on the design, learning objectives, content, and positioning of the core OM course at the MBA and UG levels. This session will feature a few invited 'Commenters', but leave most of the time for open discussion, sharing, and brainstorming.

286	Sunday, 08:00 AM - 09:30 AM, Oak Lawn	Track: Operations Management Practice
	Session: Operations Management in Emerging Markets	
	Chair(s): Eliane Simoes	

060-1673 Implementation of Electronic Commerce Innovation among Small and Micro Enterprises in Nigeria

Blessing Ajao, Student, Aalto University, Nigeria

Micro, Small and Medium Enterprises (MSMEs) are pillars of most transition economies. This is possible through the incorporation of e-commerce innovation into their routine. There is need to appraise the implementation of electronic commerce among MSMEs in Nigeria with a view to providing information that would enhance competitiveness among entrepreneurs.

060-0312 Evaluating the Effectiveness of Procedures Manuals in Public and Private Services and Industrial Organizations

Leiliane Oliveira, Student, Universidade Federal De Juiz De Fora, Brazil

Luiz Alves, Professor, Universidade Federal De Juiz De Fora, Brazil

A constant concern for organizations is the effectiveness of procedures manuals that, despite their existence, are not used correctly. This article presents the results of an investigation of this effectiveness in Brazilian companies, including the main factors for proper use of these manuals, such as clarity, training, updating, and management.

060-0014 Factors that Affect Reliability in Operation of Loading Arms of a Brazilian Petrochemical Industry

Gilberto Mourao, Student, Centro Paula Souza, Brazil

Eliane Simoes, Professor, CEETEPS, Brazil

This article aims to identify the factors that affect reliability in operation of loading arms of a Brazilian petrochemical industry. A research was developed to respond whether and how much operators and maintenance technicians are focused on the reliability process.

288	Sunday, 08:00 AM - 09:30 AM, Parlor A	Track: Purchasing and Supply Management
	Session: Ethics and Sustainability in Supply Management	
	Chair(s): Alexander Trautrimis	

060-0196 Additive Manufacturing and Its Impact on Supply Chain Management

Dara Schniederjans, Assistant Professor, University of Rhode Island, United States

Components of additive manufacturing has been around since the 1980's. However with increasing democratization, it is becoming more prevalent in manufacturing. This study seeks to address its impact on supply chain networks, sustainability and relational dynamics among supply chain partners.

060-0348 Slavery in Supply Chains

Alexander Trautrimis, Lecturer, University of Nottingham, United Kingdom

Stefan Gold, Lecturer, University of Nottingham, United Kingdom

Slavery in supply chains is a reputational and litigation risk. Although slavery is illegal around the world, slavery exists in all parts of the world. Detecting and eliminating slavery from supply chains is a challenge beyond current supply chain management knowledge and requires learning from other disciplines too.

060-0291 The Impact of Ethical Sourcing Risks on Financial Performance

Seongtae Kim, Student, Hull University Business School, United Kingdom

Riccardo Mogre, Lecturer, Hull University Business School, United Kingdom

This study examines the announcement (1990-2014) of corporate events related to ethical sourcing risks (including human rights risks, worker protest risks, and product safety risks) in the upstream supply chain for 240 US publicly traded firms. The results show that the stock market reaction is generally negative and significant.

289	Sunday, 08:00 AM - 09:30 AM, Parlor B	Track: Risk Management in Operations
	Session: Managing Supply Chain Disruptions	
	Chair(s): Yuhong Li	

060-1044 Moving Toward a Typology of Supply-chain Disruptions

Mikaella Polyviou, Student, Ohio State University, United States

A. Knemeyer, Associate Professor, Ohio State University, United States

Johnny Rungtusanatham, Professor, Ohio State University, United States

A typology is a multidimensional, theoretically-based classification of a phenomenon of interest. Supply-chain disruptions have typically been differentiated based on a single or two dimensions. We propose a typology of supply-chain disruptions in an attempt to enhance theorizing in regards to antecedents and outcomes of supply-chain disruptions.

060-1442 Supply Chain Resilience and Operational Performance: Some Empirical Findings

Theekshana Somaratna, Student, Rutgers University, United States

Arash Azadegan, Assistant Professor, Rutgers University, United States

Based on resource dependency theory, this paper explores how supply chain resilience can enable organizations to more effectively perform during large scale disruptions and in dynamic environments. We empirically validate these relationships by using SEM to analyze data from 300 manufacturing firms.

060-1326 Surveillance on Supply Networks – The Likelihood of Detection

Güven Demirel, Assistant Professor, University of Nottingham, United Kingdom

Bart MacCarthy, Professor, University of Nottingham, United Kingdom

Motivated by recent supply network failures, we examine the effectiveness of surveillance on producer supply networks where an authority such as a government agency also inspects final products. Our analysis reveals insights on non-conformance detection and the surveillance protocol, authority inspection frequency, and supplier characteristics under different production scenarios.

060-1052 Constructing a Optimal Portfolio of Suppliers under Supply Disruption Risks

Purushottam Meena, Assistant Professor, New York Institute of Technology, United States

Sarada Sarmah, Associate Professor, Indian Institute of Technology Kharagpur, India

This paper studies a problem of constructing a portfolio of suppliers (i.e., supplier selection and demand allocation) under the risks of supplier failure due to the occurrence of disruptive events. An analytical model and solution procedure are developed to determine the optimal portfolio of suppliers.

060-0506 Evaluating the Value of Disruption Information for Mitigating Supply Chain Risks

Yuhong Li, Student, Virginia Polytechnic Institute And State University, United States

Christopher Zobel, Professor, Virginia Polytechnic Institute And State University, United States

Disruption information creates benefits: with this information, firms can choose better strategies to mitigate supply chain risks. We develop a single product model to quantify the value of disruption information for managing supply chain risks, and to show how this value changes with other parameters (e.g. disruption probabilities).

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Sunday, 08:00 AM - 09:30 AM, Cabinet

Session: Emerging Scholars Program 1

Chair(s): Jack Kanet

Track: Meetings & Symposiums

060-1707 Emerging Scholars Program 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.

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Sunday, 09:45 AM - 11:15 AM, Columbia 1
Session: Joint Session: BIOM and Health Care
Chair(s): Stefan Scholtes

Track: Behavior in Operations Management

- 060-0921** Productivity under Shared Resources: The Impact of Non-anonymous Performance Metrics and Fast-working Peers
Hummy Song, Student, Harvard University, United States
Anita Tucker, Associate Professor, Brandeis International Business School, United States
Karen Murrell, Assistant Physician in Chief, Kaiser Permanente South Sacramento Medical Center, United States
David Vinson, Senior Physician and Local Research Chair, Kaiser Permanente Roseville Medical Center, United States

We explore the impact on patient wait time and length of stay (LOS) of non-anonymously displaying all physicians' average LOS metrics in an emergency department. We explore the heterogeneity in this effect by a physician's baseline productivity, level of experience, and the productivity mix of physicians on the same shift.

- 060-1566** Decomposing the Effect of Workload on Patient Outcomes: An Empirical Analysis of a Maternity Unit
Michael Freeman, Student, Judge Business School, United Kingdom
Nicos Savva, Assistant Professor, London Business School, United Kingdom
Stefan Scholtes, Professor, Judge Business School, Great Britain

In this paper we use a detailed dataset from the delivery unit of a major teaching hospital to better understand how workload impacts quality in service settings.

- 060-1028** Decision Making in Humanitarian Logistics Operations
Maximilian Burkhardt, Student, Whu - Otto Beisheim School of Management, Germany
Stefan Spinler, Professor, Whu - Otto Beisheim School of Management, Germany

We examine behavioral decision biases, heuristics and their effect on decision makers in slow-onset humanitarian logistics operations. Furthermore we provide actionable recommendations on how to develop countermeasures and create incentive schemes for improved decision making under ambiguity, by testing decision heuristics.

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Sunday, 09:45 AM - 11:15 AM, Columbia 2
Session: Consumer Markets in Closed-Loop Supply Chains
Chair(s): Erin McKie

Track: Closed Loop Supply Chains

- 060-0058** New versus Refurbished: Key Factors That Influence Consumers' Choices
Erin McKie, Student, University of South Carolina, United States
Mark Ferguson, Professor, University of South Carolina, United States
Michael Galbreth, Associate Professor, University of South Carolina, United States

Remanufacturing is increasingly providing new profit opportunities for firms, and more product condition options – such as new, refurbished, and used – for consumers to choose between. Using secondary data and choice model analysis techniques, this study estimates the influence of various factors on consumers' purchasing decisions.

- 060-0051** Back Ends of Closed Loop Supply Chains: Evidence from the Resale Industry
Brian Jacobs, Assistant Professor, Michigan State University, United States

Closed loop supply chain literature calls for research on the back processes end (pricing, consumer behavior, and sales). From field interviews at several types of consumer resale stores, we develop research questions and insights that are applicable to both resellers and remanufacturers.

- 060-0329** Customer Satisfaction with Remanufactured Products
Ravi Subramanian, Associate Professor, Scheller College of Business, United States
Ramanath Subramanyam, Associate Professor, University of Illinois Urbana-Champaign, United States
Samuel Bond, Associate Professor, Scheller College of Business, United States

Due to the purported comparable-to-new performance, customer satisfaction with remanufactured products relative to their new counterparts is of key concern to OEMs and Third Parties offering them. We empirically compare customer satisfaction levels for remanufactured and new products.

- 060-1459** Remanufacturing Strategies for OEMs without Remanufacturing Capabilities
Anton Ovchinnikov, Associate Professor, Queens University, Canada
Yu Xiong, Senior Lecturer, Chongqing University, China

We experimentally investigate the differences in consumer willingness-to-pay for reman products as a function of who sells them: OEM, 3rd party on its own or with OEM's license. Based on such differences we then analytically investigate how an OEM should interact with 3rd party remanufacturers.

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Sunday, 09:45 AM - 11:15 AM, Columbia 3
Session: Industry Studies & Public Policy – II
Chair(s): Edward Anderson

Track: Empirical Research in Operations Management

- 060-0525** Process Improvement in Healthcare: The Lean Illusion
Reuben McDaniel, Professor, University of Texas Austin, United States

Edward Anderson, Associate Professor, University of Texas Austin, United States

Lean process improvement works well in manufacturing, but its employment in healthcare has been problematic. We argue that the direct arbitrage of lean PI tools from manufacturing into healthcare is responsible for this problem and then discuss potential ways to preserve lean's potential for process improvement in the healthcare context.

- 060-0542** Innovation, learning and Sensing: The Case of the Supermarine Spitfire
Jane Davies, Assistant Professor, University of Cambridge, United Kingdom
Matthias Holweg, Professor, University of Oxford, United Kingdom
Frits Pil, Professor, University of Pittsburgh, United States

Competition among firms leads to a dynamic and self-reinforcing escalation in performance. Firms meet these performance requirements through multiple avenues including learning effects, sensing and innovation. We use operational data for 22,964 RAF Supermarine Spitfire aircraft to evaluate these sources of performance and survival rates during World War II.

- 060-1364** Energy's Digital Revolution
Peter Evans, Vice President, The Center for Global Enterprise, United States
Geoffrey Parker, Professor, Tulane University, United States

The energy industry has long suffered from information problems but conditions are rapidly changing. Energy systems' convergence with advanced computing, analytics, sensing, and new levels of connectivity is facilitating the growing information intensity across the energy sector. We present a snapshot of the rising energy information industry and make predictions.

- 060-0869** The Impact of Network Structure and Network Embeddedness on Performance in the Video Game Industry
Yingchao Lan, Student, Ohio State University, United States
Brett Massimino, Assistant Professor, Cornell University, United States
John Gray, Associate Professor, Ohio State University, United States

Despite a consensus that supply networks play a critical role in product development processes, empirical evidence linking network structure, network embeddedness, and performance is scarce. Facilitated with Social Network Analysis, we provide a longitudinal study employing secondary data to investigate some such relationships in the video game industry.

294	Sunday, 09:45 AM - 11:15 AM, Columbia 4	Track: Retail Operations Management
	Session: E-Commerce and Inventory in Retailing	
	Chair(s): Gangshu Cai	

- 060-0103** Optimal Fulfillment Strategy of Online Marketplaces
Wenjing Shen, Assistant Professor, Drexel University, United States
Gangshu Cai, Associate Professor, Santa Clara University, United States
Xiangfeng Chen, Associate Professor, Fudan University, China

Large online retailers, such as Amazon.com and Sears.com, allow small retailers to sell on their online marketplaces and offer fulfillment service to handle the order fulfillment activities for small retailers. We investigate the benefit of such programs and the optimal fulfillment fee decisions.

- 060-0987** The Role of Strategic Inventory with Bargaining and Supply Chain Competition
Lucy Chen, Assistant Professor, National University of Singapore, Singapore
Weijia Gu, N/A, IMS Health Consulting, Singapore

We investigate the existence and the effect of strategic inventories for a supply chain under a bargaining framework and compare the results to those under a Stackelberg game. We then introduce supply chain competition into the system and study how the impact of strategic inventories changes.

- 060-0336** The Future of Retail Operations Management Technology
Matthew Lanham, Merchandise Data Scientist, Advance Auto Parts, Inc., United States

We discuss the extensive use of commercial software in retail operations and how a shift toward developing more tunable in-house open-source solutions are becoming more frequent as retailers continue to invest in business analytics and big data analytics projects. We provide some examples from a Fortune 500 auto parts retailer.

295	Sunday, 09:45 AM - 11:15 AM, Columbia 9	Track: Tutorials and Panel Discussions
	Session: Prescriptive Empirical Operations Management	
	Chair(s): David Simchi-Levi George Shanthikumar	

- 060-1697** Applying Machine Learning in Online Revenue Management
David Simchi-Levi, Professor, Massachusetts Institute of Technology, United States

In a dynamic pricing problem where the demand function is unknown a priori, price experimentation can be used for demand learning. In practice, however, online sellers are faced with a few business constraints, including the inability to conduct extensive experimentation, limited inventory and high demand uncertainty. In this tutorial we discuss models and algorithms that combine machine learning and price optimization and significantly improve revenue. We report results from live implementations at companies such as Rue La La, Groupon and a large European Airline carrier.

- 060-0003** Panel Discussion on Prescriptive Empirical Research
David Simchi-Levi, Professor, Massachusetts Institute of Technology, United States

George Shanthikumar, Professor, Purdue University, United States
Sridhar Tayur, Professor, Carnegie Mellon University, United States
Vinayak Deshpande, Associate Professor, University of North Carolina Chapel Hill, United States

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Sunday, 09:45 AM - 11:15 AM, Columbia 10
Session: Reporting and Implementing Sustainability
Chair(s): Suvrat Dhanorkar

Track: Sustainable Operations

- 060-0363** The Impact of Negative Environmental Publicity on Firm Value - The Role of a Green Reputation
Rick Hardcopf, Student, University of Minnesota, United States
Rachna Shah, Associate Professor, University of Minnesota, United States

Researchers have shown that negative environmental publicity typically results in reduced firm value. Researchers have also shown that prior reputation can either buffer a firm against negative shocks or magnify them, depending on context. The current research attempts to evaluate how a green reputation moderates this relationship, if at all.

- 060-0744** Relationship between Appointments of Sustainability Officers and Performance
Manpreet Hora, Assistant Professor, Georgia Institute of Technology, United States
Ravi Subramanian, Associate Professor, Georgia Institute of Technology, United States

In recent years, firms have been creating and staffing senior-level environmental and sustainability positions. We investigate the association between announcements pertaining to appointments of senior-level environmental or sustainability officers and firm performance.

- 060-1289** Promoting Change from the Outside: Externally Managing Environmental Improvement Projects
Suvrat Dhanorkar, Student, University of Minnesota, United States
Enno Siemsen, Associate Professor, University of Minnesota, United States
Kevin Linderman, Professor, University of Minnesota, United States

The challenge of externally promoting change is ubiquitous in operations, supply chain and policy settings. Using longitudinal archival data on 650+ environmental improvement (EI) projects in industrial facilities located in Minnesota, we examine how various external influence tactics spur as well as disrupt implementation.

- 060-1372** Disclosure of Environmental Information in the Companies of Paper and Pulp Sector, Listed in BM&FBovespa
Danilo Oliveira, Student, UFGD, Brazil
Antonio Carlos Vaz Lopes, Student, Univ. Federal Da Grande Dourados, Brazil
Sergio Adelar Brun, Student, Universidade Tecnológica do Paraná, Brazil

The purpose of this paper was to analyze the predominance of the environmental information in the companies of paper and pulp sector, listed in BM&FBovespa, in the period between 2011 and 2013 from administration sustainability reports and explanatory notes the companies environmental disclosure is deficient related to the norm.

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Sunday, 09:45 AM - 11:15 AM, Columbia 11
Session: Energy Management
Chair(s): Chao An

Track: Sustainable Operations

- 060-1651** Using Complementary Renewable Energy Resources for a Sustainable Clean Energy Supply
Soumia Ichoua, Associate Professor, Embry-Riddle Aeronautical University, United States

We propose a two-stage stochastic programming model to plan for an effective use of renewable energy resources. The goal is to provide a clean and sustainable energy supply. Different balancing renewable energy resources such as wind turbines and solar photovoltaic are combined to reduce their stochastic fluctuations.

- 060-0588** The Impact of Port Time Uncertainties on Fuel Emissions and Service Level in Liner Shipping
Afshin Mansouri, Senior Lecturer, Brunel University, United Kingdom
Emel Aktas, Senior Lecturer, Cranfield University, United Kingdom

We investigate the impact of port time uncertainties on fuel emissions and service level in liner shipping. Our analyses provide managerial insights for ship liners and port operators and emphasize the role of collaboration between ports and shipping companies in reducing fuel emissions and improving service level in maritime shipping.

- 060-0269** Sustainable Operations in the Hotel Industry
Arvind Upadhyay, Lecturer, University of Brighton, United Kingdom
Celine Vadam, Professor, ESCAET, France
Sushil Mohan, Lecturer, University of Brighton, United Kingdom

Sustainability and energy efficiency are the key issue in all industries. In the hotel industry, energy consumption represents 3-6% of hotel operating costs and is responsible for 60 percent of its CO2 emissions. This paper explores the various issues linked with sustainability and energy consumption in this industry.

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Sunday, 09:45 AM - 11:15 AM, Columbia 12

Track: Manufacturing Operations*Session:* Technology and Innovation*Chair(s):* Mats Ahlskog**060-1217** Self Optimizing Mechanisms within a Cybernetic Framework for Production Systems

Christina Reuter, Senior Lecturer, RWTH Aachen University, Germany

Timo Nuyken, Lecturer, Laboratory for Machine Tools and Production Engineering (WZL) RWTH Aachen Univer, Germany

Bartholomaeus Wolff, Lecturer, Laboratory for Machine Tools and Production Engineering (WZL) RWTH Aachen Univer, Germany

The paper introduces a holistic research framework for production systems that combines deterministic models with the cybernetic structure of the viable system model and shows how self optimizing mechanisms can be integrated in this framework.

060-1619 Capabilities Development through Global Manufacturing Virtual Networks

Cristiane Biazzin, Lecturer, Fundacao Getulio Vargas, Brazil

Today several e-business concepts are deployed to support Manufacturing Management Systems in order to achieve and speed up superior results. However sharing virtually information is not enough. This research aims to explore how global manufacturing corporations have been using virtual networks to develop operational capabilities.

060-0771 Manufacturing Technology Readiness Assessment

Mats Ahlskog, Student, Mälardalen University, Sweden

The purpose of this paper is to analyze and discuss how the MRL scale can support the assessment of a manufacturing technology's maturity level. A single case study within the manufacturing industry has been conducted investigating the use of a MRL scale. An assessment of MRL 4 has been studied.

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Sunday, 09:45 AM - 11:15 AM, Piscataway

Track: Inventory Management*Session:* Case/Empirical Studies in Inventory Management*Chair(s):* Sandeep Goyal**060-0894** Inventory Management Policy: A Case Study in a Brazilian Tobacco Firm

Julianne Rodrigues, Student, Federal University of Uberlandia, Brazil

Valeriana Cunha, Assistant Professor, Federal University of Uberlandia, Brazil

Etienne Abdala, Assistant Professor, Federal University of Uberlandia, Brazil

This paper presents a case study about inventory management of semi finished goods at a tobacco firm in Brazil. A new inventory management policy was developed. The results reveal that safety inventory size is limited by the storage capacity. It's suggested a feasibility study to enhance storage capacity

060-1311 Retail Store Inventory Management

Bill Hardgrave, Professor, Auburn University, United States

John Aloysius, Associate Professor, University of Arkansas, United States

Andrew Manikas, Assistant Professor, University of Louisville, United States

Sandeep Goyal, Assistant Professor, University of Louisville, United States

We present the results of a field-experiment conducted at a fortune 500 apparel retailer that helps better understand the impact of RFID-enabled visibility. Findings of this experiment challenge the common assumption that RFID-enabled visibility is an antidote to poor store execution. Our experiment has implications for retail store product availability.

060-0350 The Impact of Inventory Management on Debtor Performance

David Bendig, Student, RWTH Aachen University, Germany

Malte Brettel, Professor, RWTH Aachen University, Germany

Long-term debt is the major financing resource for manufacturing companies. However, the role of long-term debt has been a largely overlooked topic within empirical inventory management research so far. Therefore our study analyzes based on US corporate bond data how inventory management influences debtor qualities.

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Sunday, 09:45 AM - 11:15 AM, Cardozo

Track: Information in Operations Management*Session:* Economics of IS*Chair(s):* Marius Niculescu**060-1101** Allocation and Pricing of Substitutable Goods: Theory and Algorithm

Huaxia Rui, Assistant Professor, University of Rochester, United States

De Liu, Associate Professor, University of Kentucky, United States

Andrew Whinston, Professor, University of Texas Austin, United States

we study the allocation of numerous types of goods among multiple agents and the associated equilibrium prices when goods may be substitutable and the rates of substitution may differ across agents. We developed a theory and an algorithm for the optimal allocation.

060-1369 An Analysis of a Mobile Platform's Advertising Contract under Agency Pricing for App Sales

Lin Hao, Assistant Professor, University of Notre Dame, United States

Hong Guo, Assistant Professor, University of Notre Dame, United States

Robert Easley, Associate Professor, University of Notre Dame, United States

We develop a two-sided market model to analyze a mobile platform owner's optimal advertising contract in the presence of agency pricing for the app sales channel. Our results reveal that under certain market conditions, the platform owner could gain more profit by raising the app developer's advertising revenue sharing percentage.

060-1407 Platform or Wholesale? A Strategic Tool for Online Retailers to Benefit from Product Reviews

Young Kwark, Assistant Professor, University of Florida, United States

Jianqing Chen, Associate Professor, University of Texas Dallas, United States

Srinivasan Raghunathan, Professor, University of Texas Dallas, United States

In online retailing in which a channel structure is common, retailers choose different contract with upstream sellers and routinely provide access to product reviews. We show whether the retailer can benefit from the reviews depends on its pricing scheme choice, the precision of the reviews, and the product categories.

060-1715 Using Public Betas and Product Trials to Launch a New Software Product

Amit Mehra, Assistant Professor, Indian School of Business, India

Rajib Saha, Assistant Professor, Indian School of Business, India

A public beta of a software product provides feedback to improve product quality and also creates a quality perception about the product. Product trials also influence customers' quality perception. We study how public betas and trials should be used conjunction and find that this depends on the type of software-product.

301

Sunday, 09:45 AM - 11:15 AM, Du Pont

Track: Humanitarian and Not-for-profit Operations

Session: Capturing Uncertainty in Nonprofit Operations Modelling: From resource allocation to direct-marketing fundraising

Chair(s): Elizabeth Durango-Cohen

060-1357 Tasks Allocation in Unknown Demand Environment: Linear Programming and Clustering Analysis

Miguel Ruiz, Student, University of Puerto Rico, United States

Betzabe Rodriguez, Assistant Professor, University of Puerto Rico, Puerto Rico

This research studies resource allocation in a complex non-profit environment. Some of the complexities are: Demand data not available, diversity of tasks, diversity of agents' skills and preferences, complex definition of tasks' utility. The proposal is first use clustering to estimate needs and then assign tasks with an optimization model.

060-1468 Tailoring Contribution Requests to Improve Donor Participation and Monetary Value of Contributions

Elizabeth Durango-Cohen, Associate Professor, Illinois Institute of Technology, United States

Matthew Beamer, Student, Northwestern University, United States

Pablo Durango-Cohen, Associate Professor, Northwestern University, United States

Nonprofit organizations utilize gift strings (or suggested gift amounts) in their fundraising mailings to influence donor contribution behavior. We present results from a large field experiment that aims to capture the effect of different anchoring schemes on the likelihood of observing a donation, and on the monetary value of contributions

060-0096 Cultivating Disaster Donors Using Data Analytics

Ilya Ryzhov, Assistant Professor, University of Maryland, United States

Bin Han, Student, University of Maryland, United States

Jelena Bradic, Assistant Professor, University of California San Diego, United States

We empirically analyze several current practices for direct-mail nonprofit fundraising, based on a massive dataset covering 8.6 million communications with American Red Cross donors during 2009-2011. We find that emphasizing development over relief is effective for engaging recurring donors, and provide insights into design effects on different donor segments.

060-1273 Improving Resource Management in Early Hours of a Disaster

Monique French, Associate Professor, University of Colorado Colorado Springs, United States

Ying Fan, Assistant Professor, University of Colorado Colorado Springs, United States

Gary Stading, Professor, University of Houston Downtown, United States

During the initial phases of a disaster, resource management can be challenging as the scope of the disaster is unfolding. Decisions often must be made quickly with limited information to preserve life and property. This study explores antecedents to the resource management chaos such as task environment and organizational culture.

302

Sunday, 09:45 AM - 11:15 AM, Embassy

Track: Humanitarian and Not-for-profit Operations

Session: Reviewing the field of humanitarian operations

Chair(s): Steve Melnyk

060-0836 Disaster Operations Management and a Research Agenda

Niratcha Tungtisanont, Student, Clemson University, United States

Aleda Roth, Professor, Clemson University, United States

Yann Ferrand, Assistant Professor, Clemson University, United States

We first motivate the need for a humanitarian operations agenda, describing operations management gaps and future research directions. We then conceptualize humanitarian and disaster operations in multiple ways, including the four phases of the disaster cycle and a typology of natural disasters. Finally, we perform an econometrics analysis.

- 060-0762** Gaps between Research and Practice in Humanitarian Logistics
Shawn Bhimani, Student, Duke University Durham, United States
Jeannette Song, Professor, Duke University Durham, United States

We compare Humanitarian Logistics research to needs in practice. First we provide an overview of recent humanitarian operations research in the OR/MS field to develop an understanding of academic contributions. We then outline the gaps between research and practice in order to offer insights to spur analysis and collaboration.

- 060-0907** Current and Future Concerns for Humanitarian Logistics - A Delphi Study
Peter Tatham, Professor, Griffith University, Australia
Gyongyi Kovacs, Professor, Hanken University, Finland
Steve Melnyk, Professor, Michigan State University, United States

Humanitarian logistics is a field that is increasing in importance and experiencing changes. This presentation identifies and explores the importance of developments to humanitarian logistics both today and five years from now using a Delphi Methods approach. The factors explored include funding, interoperability, security, professionalism, sustainability, and service development.

- 060-1226** Strategic Humanitarian Operations: A Virtuous Cycle of Mitigation, Prosperity and Resilience
ManMohan Sodhi, Professor, Cass Business School, United Kingdom

This paper offers an empirically supported conceptualisation of strategic humanitarian operations spanning response, reconstruction, preparedness and prevention to help governmental and transnational organizations allocate resources to combat disasters. We provide empirical support with global country-level economic and disaster data over five decades from 1962 to 2013.

303	Sunday, 09:45 AM - 11:15 AM, Fairchild East	Track: Healthcare Operations Management
	Session: Emergency resource allocation	
	Chair(s): Alex Mills	

- 060-0726** Pareto Improving Flow Control Policies for Multi-server Emergency Departments - New Perspectives
Hung Do, Assistant Professor, University of Vermont, United States
Masha Shunko, Assistant Professor, Purdue University, United States

Using Emergency Medical Services setting as motivation, we design and analyze flow control policies for service systems with N multiple-server queues. We focus on policies that improve performance of the system and that are also beneficial to all involved entities. We propose a new perspective on performance measures, conduct analysis and reveal managerial insights that help design such Pareto improving policies in practice.

- 060-1481** Information Sharing in Urban Incident Response
Andres Jola Sanchez, Student, Indiana University Bloomington, United States
Alex Mills, Assistant Professor, Indiana University, United States
Jonathan Helm, Assistant Professor, Indiana University, United States
Mohan Tatikonda, Professor, Indiana University, United States
Bobby Courtney, M.A., Indiana University, United States

Following a disaster in an urban area, on-scene responders decide how to distribute casualties to hospitals. Using data from a major metropolitan area, we show the value of different types of coordination regarding hospitals' capacity information. While good coordination improves the response, it also magnifies the effect of predictable variability

- 060-1525** Does Limiting Time on Ambulance Diversion Reduce Diversions? Signaling Equilibrium and Network Effect
Eric Park, Lecturer, University of British Columbia, Canada
Sarang Deo, Assistant Professor, Indian School of Business, India
Itai Gurvich, Associate Professor, Northwestern University, United States

We study the effect of a policy intervention intended to reduce ambulance diversions in LA County, CA. Using a conceptual framework of emergency department (ED) congestion signaling, we find that that EDs improved patient flow process in response to the intervention and paramedics responded by reducing diverted ambulances.

- 060-1536** Choice of Urgent Care by Strategic but Uninformed Patients
Ozden Cakici, Assistant Professor, American University, United States
Rajiv Dewan, Professor, University of Rochester, United States
Marshall Freimer, Emeritus Professor, University of Rochester, United States

We model a strategic patient's decision between a fully equipped emergency department and a more convenient but less capable urgent care center or retail clinic. The model allows for errors in a patient's self-triage before the choice is made as well as the expected wait times and co-pays incurred.

304

Sunday, 09:45 AM - 11:15 AM, Fairchild West
Session: Hospital service and surgery planning
Chair(s): Siqan Shen

Track: Healthcare Operations Management

- 060-1263** Application of Supervised Machine Learning Methods to Predict Daily Hospital Discharges
Sean Barnes, Professor, University of Maryland, United States
Eric Hamrock, Senior Project Administrator, Johns Hopkins Health System, United States
Sauleh Siddiqui, Assistant Professor, Johns Hopkins University, United States
Matthew Toerper, Senior Software Engineer, Johns Hopkins University, United States
Scott Levin, Associate Professor, Johns Hopkins University, United States

We apply supervised machine learning methods to predict whether patients are likely to be discharged each day in a medical hospital unit. We compare the predictive performance for logistic regression, classification and regression trees, and ensemble learning approaches to predictions generated by clinicians.

- 060-1362** Advance Ward Predictions with Multi-class Classification and Feature Selection
Seung Yup Lee, Student, Wayne State University, United States
Ratna Babu Chinnam, Professor, Wayne State University, United States
Azade Tabaie, Student, Wayne State University, United States
Sina Faridimehr, Student, Wayne State University, United States
Alper Murat, Associate Professor, Wayne State University, United States
Evrin Dalkiran, Assistant Professor, Wayne State University, United States
Qingyu Yang, Assistant Professor, Wayne State University, United States
Hakimuddin Neemuchwala, Project manager, VA Medical Center, United States
Michael Lederle, Systems analyst, VA Medical Center, United States

Emergency department is the dominant channel for admissions in many hospitals. Research suggests that advance prediction of the target inpatient ward for an ED patient can help with proactive coordination and supply/demand alignment of inpatient ward resources. We present results from machine learning techniques using data from VA Medical Centers.

- 060-0994** Planning of Hospital-wide Services Based on Uncertain Clinical Pathways
Ines Arnolds, Student, Karlsruhe Institute of Technology, Germany
Daniel Gartner, Student, Carnegie Mellon University, United States
Stefan Nickel, Professor, Karlsruhe Institute of Technology, Germany

Recent research has highlighted the potential of analytics techniques applied to healthcare datasets to study process standardization by clinical pathways (CPs). We dovetail predicting significant CPs and hospital-wide service planning by connecting a stochastic automaton-based machine learning approach with two mathematical programs. Results are shown on different performance measures.

- 060-1659** Chance-constrained Surgery Planning under Uncertain or Ambiguous Surgery Durations
Yan Deng, Student, University of Michigan Ann Arbor, United States
Siqan Shen, Assistant Professor, University of Michigan Ann Arbor, United States
Brian Denton, Associate Professor, University of Michigan Ann Arbor, United States

We study surgery planning problems with uncertain surgery durations and probabilistic constraints restricting risk of delays and overtime. We develop cutting-plane algorithms exploiting decomposable problem structure, and study distributionally-robust problem variants by assuming ambiguous distributional information. Computational experiments on real data reveal insights in surgery planning with uncertainty.

306

Sunday, 09:45 AM - 11:15 AM, Gunston West
Session: information/forecasting in supply chain management
Chair(s): Hyoduk Shin

Track: Marketing and OM Interface

- 060-0818** Dynamic Pricing of Vertically Differentiated Products with Unknown Customer Heterogeneity
Bora Keskin, Assistant Professor, University of Chicago, United States
Meng Li, Student, University of Illinois Urbana-Champaign, United States

Consumers are often heterogeneous in their preferences for product quality, and a company usually faces an uncertainty about the consumer preferences when it sells differentiated products to such heterogeneous consumers. In this paper, we study this problem where the company dynamically optimizes its prices.

- 060-0503** Should Companies Invest in Joint Promotions?
Salma Karray, Associate Professor, University of Ontario Institute of Technology, Canada
Simon-Pierre Sique, Professor, Athabasca University, Canada

We investigate whether firms should invest in joint promotions for their complementary products with partners that are competitors in other product categories. We develop a game-theoretic model and solve for Nash equilibrium strategies. The main results show that spillover effects significantly affect the viability of such promotions.

- 060-1233** The Perils of Sharing Information in a Trade Association under a Strategic Wholesale Price
Noam Shamir, Assistant Professor, Tel Aviv University, Israel

Hyoduk Shin, Assistant Professor, University of California San Diego, United States

Studying the incentives of a group of retailers, organized as a trade association, to exchange forecast information, we compare between two industry policies: exclusionary and non-exclusionary information sharing. Although non-exclusionary policy has been advocated to promote information sharing, we show the opposite can happen and explain the reason.

307

Sunday, 09:45 AM - 11:15 AM, Coats

Track: Economics Models of Operations

Session: Economic Models

Chair(s): Xuanming Su Jaelynn Oh

060-1449 Simultaneous vs. Sequential Crowdsourcing Contests

Ming Hu, Assistant Professor, University of Toronto, Canada

Lu Wang, Student, University of Toronto, Canada

We compare two mechanisms for a crowdsourcing contest when innovation demands expertise in multiple attributes. One is to run a simultaneous contest, where a single aggregated solution is simultaneously submitted by each contestant. The other is to run multiple sequential sub-contests, with each dedicated to one attribute.

060-1531 Benefit and Cost of Selfishness in Queue

Hakjin Chung, Student, University of Michigan Ann Arbor, United States

Hyun-soo Ahn, Associate Professor, University of Michigan Ann Arbor, United States

Rhonda Righter, Professor, University of California Berkeley, United States

We examine how customer's and provider's selfishness to improve their own utility influences the system performance and optimal provision of capacity in context of a queueing system. We find that , in contrast to conventional intuition, selfishness does not always decrease social surplus and explain why it happens.

060-1529 Optimal Pricing of Reservations and Advance Selling

Xuanming Su, Associate Professor, University of Pennsylvania, United States

Jaelynn Oh, Assistant Professor, University of Utah, United States

Customers who make reservations in advance are guaranteed service when they show up. We study whether and how firms should charge for reservations and relate our results to advance selling strategies.

308

Sunday, 09:45 AM - 11:15 AM, Monroe

Track: Product Innovation and Technology Management

Session: Managing Innovation Across the Value Chain: From Conceptualization to Commercialization

Chair(s): Gulru Ozkan-Seely

060-0295 When is Necessity the Mother of Invention?

Sezer Ulku, Associate Professor, Georgetown University, United States

Stylianios Kavadias, Professor, University of Cambridge, United Kingdom

Many claim that "necessity is the mother of invention" and that adversity induces creative thinking. Yet, the presence of unknowns point to the need for unconstrained search; constraints should make it difficult to change direction with new information, resulting in inferior solutions. We explore how constraints affect entrepreneurial performance.

060-1047 Organizational Ambidexterity and Networks in Successful Technology Commercialization

Andrew Earle, Assistant Professor, University of New Hampshire, United States

We examine effects of specific network attributes on exploration and exploitation outcomes of 168 firms over 12 years involved in technology commercialization in the field of "green chemistry". These results contribute to our understanding of ambidextrous approaches to innovation in general and the strategic use networks in particular.

060-0571 Switching from R to D: Role of Incentives and Institutional Design

Lakshminarayana Nittala, Student, University of California San Diego, United States

Sanjiv Erat, Associate Professor, University of California San Diego, United States

Vish Krishnan, Professor, University of California San Diego, United States

We develop a model of an agent who dynamically selects when she switches from idea generation stage to idea development stage. Within this parsimonious model that mimics many contexts in innovation, we consider the effect of incentives and several institutional features on the optimal idea generation and development strategy.

060-1136 Optimal Shapes of Innovation Pipelines

Joel Wooten, Assistant Professor, University of South Carolina, United States

Sriram Venkataraman, Assistant Professor, University of South Carolina, United States

New product introductions often occur via R&D pipelines. We explore the optimal number of innovation options to pursue in this complex managerial process. A stylized game simulation of the pharma industry provides additional evidence for our problem.

309

Sunday, 09:45 AM - 11:15 AM, Holmead East
Session: Transparency in Operations
Chair(s): Ryan Buell

Track: Service Operations**060-1252** Transparency and Indirect Reciprocity in Social Responsibility: An Incentivized Experiment

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 design an incentivized experiment to study the impact of transparency on consumers' valuations of a firm's social responsibility practices. We investigate how much of consumers' valuations can be attributed to indirect reciprocity. We also analyze how heterogeneity in prosocial orientation impacts the roles of transparency and indirect reciprocity.

060-1453 Transparency Trap

Ethan Bernstein, Assistant Professor, Harvard Business School, United States

To get people to be more creative and productive, managers increase transparency with open workspaces and access to real-time data. But less transparent work environments can yield more-transparent employees. Organizations which balance transparency and privacy may encourage the right amount of "productive deviance" to foster innovative behavior and boost productivity.

060-1269 Mobile Money: The Effect of Service Quality and Competition on Demand

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 electronic currency ecosystem in the developing world. We estimate the effect of service quality (pricing transparency, service reliability and expertise) and interactions with competition on mobile money agent demand.

060-1485 Surfacing the Submerged State with Operational Transparency in Government Services

Ryan Buell, Professor, Harvard University, United States
Michael Norton, Professor, Harvard Business School, United States
Ethan Porter, Student, University of Chicago, United States

While transparency in government is customarily trained on elected officials, our research documents the benefits of increased transparency into the delivery of government services. Leveraging several field experiments in the City of Boston, we investigate the impact of operational transparency on residents' attitudes, support, and engagement with the government.

310

Sunday, 09:45 AM - 11:15 AM, Holmead West
Session: Public Sector Services, and Interfaces of Services with Other Fields
Chair(s): Lixin CUI

Track: Service Operations**060-0192** How an Existing Telecommunications Network Can Support the Deployment of Smart Meters in a Water Utility?

Samuel Moraes, Student, CEETEPS, Brazil
Celi Langhi, Professor, CEETEPS, Brazil
Marcos Crivelaro, Professor, CEETEPS, Brazil

Based on the evaluation of a water utility telecommunications network, this case study aims to understand what kind of adjustments are needed to make it support a water smart metering system.

060-1628 Changes in a Brazilian State Public Audit Office

Jorge Scarpin, Professor, Universidade Federal do Parana, Brazil
Sandi Kutianski, Student, Universidade Federal do Parana, Brazil

This paper reports the results of a case study in a Brazilian state public audit office. We investigate the process changes due to new accounting regulation law. Nine in-depth interviews with public audit analysts show that there were several internal changes on information system and on relationship with audited cities.

060-0698 Improving Public Services

Thomas Bortolotti, Lecturer, Swansea University - School of Management, United Kingdom
Nick Rich, Professor, Swansea University - School of Management, United Kingdom
Stefania Boscari, Student, Universita Degli Studi Di Padova, Italy

Drawn upon a literature review, this work propose a theoretical framework and a survey-based instrument to study what are the characteristics of a successful improvement programme in the public sector. Preliminary results of the use of the questionnaire in a small sample of public services are also shown.

311

Sunday, 09:45 AM - 11:15 AM, Kalorama
Session: Interface of Operations and Finance
Chair(s): Qi Wu Guoming Lai

Track: Supply Chain Management**060-0580** Sourcing with Financing

Christopher Tang, Professor, University of California Los Angeles, United States
Jing Wu, Student, University of Chicago, United States

S. Alex Yang, Assistant Professor, London Business School, United Kingdom

Two financing schemes related to sourcing from a financial constrained supplier are characterized and discussed. Choosing between purchase order financing or supply chain financing, the manufacturer balances its information advantage and the bank's financing advantage.

060-0706 The Impact of Negative Demand Shocks on Trade Credit and Supply Chain Cohesion

Sripad Devalkar, Assistant Professor, Indian School of Business, India

Harish Krishnan, Associate Professor, University of British Columbia, Canada

We consider the role of trade credit in addressing moral hazard problems and restoring efficiency in a multi – level supply chain and the impact of cost of financing working capital requirements on the ability of trade credit to coordinate the supply chain.

060-1341 Flexible Investment and Capture Structure

Peter Ritchken, Professor, Case Western Reserve University, United States

Qi Wu, Assistant Professor, Case Western Reserve University, United States

We study a firm's dynamic decisions on capital structure and investment when facing operational flexibility. We show that, on one hand, the capital structure is driven by the investment opportunities and the flexibility in operations; on the other hand, the investment decisions are affected by the firm's capital structure.

060-1483 When Does Adoption of the ISO 9001 Quality Standard Improve Quality Outcomes?

William Schmidt, Assistant Professor, Cornell University, United States

Michael Toffel, Associate Professor, Harvard University, United States

We hypothesize several circumstances under which adopting the ISO 9001 quality management standard should facilitate improvements in quality outcomes. We test our theory using a difference-in-differences approach based on a coarsened exact matched sample, which enables us to draw causal inferences that link quality outcomes to ISO 9001 adoption.

312

Sunday, 09:45 AM - 11:15 AM, Jay

Session: Supply Chain Risk Management

Chair(s): Natalie Simpson

Track: Supply Chain Management

060-0614 A Reconceptualization of Supply Chain Agility Based on an Alternative Framework of Flexibilities

Soomin Park, Student, SUNY at Buffalo, United States

Nallan Suresh, Professor, SUNY at Buffalo, United States

This paper identifies key dimensions of Supply Chain (SC) agility and reconceptualizes this construct. Drawing from Operations, Marketing and Information Systems literatures, this study distinguishes between the constructs of sensing agility and responding agility, re-identifies the role of component flexibilities in supply chain agility and develops an alternative research framework.

060-1437 Evaluating Reorder Strategies in Supply Chains with Lead Time Risk

Sevilay Onal, Student, New Jersey Inst of Technology, United States

Pat Kriengkraikit, Student, New Jersey Inst of Technology, United States

Sanchoy Das, Professor, New Jersey Inst of Technology, United States

A supply chain with intermediate disruption risk is modelled by (i) probability of order disruption (ii) length of the disrupted lead time and (iii) number of successive disruption periods. A scalar policy with decision K is implemented such that reorder level is KR where R is the undisrupted reorder level.

060-1247 Mapping Supply Chain Evolution and Risk: New Measures for Complex Network Structures

Natalie Simpson, Associate Professor, SUNY at Buffalo, United States

Ta-Wei Kao, Student, University at Buffalo, United States

Many commercial supply chains have evolved into complex global networks, shaped both by design and circumstance. In this study, we demonstrate this development within several industries, and propose new network measures to monitor emergent features as the 'indeterminate-tier supplier' and 'rival connectedness'.

060-0776 Supply Risk Management Must Become Supplier Risk Management

Sudipa Sarker, Student, Department of Management, Economics & Industrial Engineering, Bangladesh

Andreas Feldmann, Lecturer, Department of Industrial Economics and Management, Sweden

Mats Engwall, Professor, Department of Industrial Economics and Management, Sweden

Paolo Trucco, Professor, Department of Management, Economics & Industrial Engineering, Italy

In this article, we argue why supply risk management must become supplier risk management. We present the analysis from an in-depth case of a global organization. Findings reveal how different supply risks are managed by carefully adding and removing suppliers from supply base and not by managing individual risk.

313

Sunday, 09:45 AM - 11:15 AM, Morgan

Session: Practical Issues in Supply Chains I

Chair(s): Ricardo Cassel

Track: Supply Chain Management

060-0344 Proposal of a Traceability Model for the Raw Brazilian Sugar Supply Chain Using RFID and WSN

Roberto Fray da Silva, Student, Universidade De Sao Paulo, Brazil

Isabel Praça, Professor, Instituto Politécnico do Porto, Portugal
Hugo Yoshizaki, Associate Professor, University of São Paulo, Brazil
Carlos Eduardo Cugnasca, Professor, Universidade De Sao Paulo, Brazil

Brazil is the world's biggest sugar exporter. Current traceability problems involve batch mixing, difficulty locating contaminated batches, and lack of adequate automatic and real time systems usage. This paper proposes a traceability model that allows for automatic product monitoring. Its main impacts and implementation issues are discussed.

060-1268 Green Talent and Supply Chain

María del Carmen Torres-Salazar, Student, Universidad Popular Autónoma del Estado de Puebla (UPAEP), Mexico
Ana Esther Escalante-Ferrer, Professor, Universidad Autónoma del Estado de Morelos, Mexico
Elias Olivares Benítez, Professor, Universidad Popular Autónoma del Estado de Puebla (UPAEP), Mexico
Juan Carlos Pérez-García, Professor, Universidad Popular Autónoma del Estado de Puebla (UPAEP), Mexico

Green supply chains are the business response to environmental degradation, however, not many studies where the importance of people in these systems is shown. The work shows what is green talent and how it affects the green supply chain through a survey. The research reaches the validation of the survey.

060-1270 Sports Value Chain in Brazil: An Analysis of the Main Constraints and Potential Performance Leverages

Ricardo Cassel, Associate Professor, Federal University of Rio Grande do Sul, Brazil
Ana Tudesco, Student, Federal University of Rio Grande do Sul, Brazil
Juliano Denicol, Student, Federal University of Rio Grande do Sul, Brazil

The sport, as a business, has a great potential for economic development. Hence, it is essential to understand the sport's value chain, identifying its main links and the main constraints that impact this chain's performance. This study aimed to analyze the value chain of three sports in Brazil.

060-1048 RFID-enabled Traceability System for Food Supply Chains

Lijing Zhu, Assistant Professor, China University of Petroleum - Beijing, China

This study analyzes an RFID-enabled traceability system for perishable food supply chains. We develop a decision-making mechanism when demand depends on price, quality, and safety of perishable food. Under a centralized supply chain, incremental profits by deploying the traceability system have been greater than those of a decentralized supply chain.

314

Sunday, 09:45 AM - 11:15 AM, Northwest

Track: General Track

Session: Designing and Teaching the OM Core Course Workshop Part II – Materials, Pedagogy, and Student Engagement
Chair(s): Joel Goldhar Arthur Hill

060-0325 Designing and Teaching the OM Core Course Workshop Part II – Materials, Pedagogy, and Student Engagement

Joel Goldhar, Professor, Illinois Institute of Technology, United States
Arthur Hill, Professor, University of Minnesota, United States

This second OM Core Course workshop will focus on materials (e.g., cases and games), pedagogies, and student engagement strategies for the core OM course. This session will feature a few invited "star" teachers, but leave most of the time for open discussion, sharing, and brainstorming.

315

Sunday, 09:45 AM - 11:15 AM, Oak Lawn

Track: Operations Management Practice

Session: Operations Management Trends and Practice
Chair(s): Tonny Rodrigues

060-1188 Strategic Substrate Supplier Capacity Planning at Intel

Dong Tang, Research Scientist in Supply Chain Managment, Intel Corporation, United States
Elyse Hallstrom, Supplier Capacity Analyst, Intel Corporation, United States
Zhenying Zhao, Operations Research Engineer, Intel Corporation, United States

Substrates are the most expensive commodity at Intel. Optimizing strategic substrate supplier capacity planning, Intel adopts mathematical models that help make decisions on retrofitting, pull-in, push-out, bringing up entirely new factories/lines, and decommissioning excess capacities. An average savings greater than 30% of substrate capital expenditures over ten years is projected.

060-1204 Impact of Age 54+ Project on Claim Processing in Social Security and National Insurance Trust (SSNIT) in Ghana

Ebenezer Adaku, Lecturer, Ghana Institute of Management and Public Administration, Ghana
Emmanuel Lomotey, Student, Ghana Institute of Management and Public, Ghana
Kwasi Amoako-Gyampah, Professor, University of North Carolina Greensboro, United States
Samuel Famiyeh, Senior Lecturer, Ghana Institute of Management and Public, Ghana

We report on the efficiency gains from a new claim processing system implemented at SSNIT in Ghana. The new system – Age 54+ - improved on the traditional system by 25%.

060-0252 Changing without Losing the Essence? An Study of BSC Adaptation at Brazilian Higher Education Institutions

Tonny Rodrigues, Associate Professor, Federal University of Rio De Janeiro, Brazil
Átila Lira, Associate Professor, Faculdade Santo Agostinho, Brazil
Irenilza Nääs, Professor, UNIP, Brazil

Brazilian HEIs, to adapt to the BSC, have used different perspectives from those originally proposed by Kaplan and Norton (1992). In this new configuration, aspects such as quality of teaching, research and extension become more common. Thus, rises a question: these changes are adjusted to the traditional philosophy of BSC?

317	Sunday, 09:45 AM - 11:15 AM, Parlor A	Track: Purchasing and Supply Management
	Session: Collaborative Approaches to Supply Management	
	Chair(s): Sean Handley	

060-1195 Do Small Suppliers Collaborate?

Mengyang Pan, Student, Ohio State University, United States
Johnny Rungtusanatham, Professor, Ohio State University, United States
James Hill, Associate Professor, Ohio State University, United States

Securing sales increases is the biggest challenge for small suppliers due to limited resources and reputation. Collaboration has been suggested in literature as a strategy for them to overcome such scarcity. In practice, do small suppliers really collaborate? If yes, with whom do they collaborate? How and why?

060-1071 Supplier Development as Managerial and Operational Knowledge Transfer: The Relational View

Daesik Hur, Associate Professor, Yonsei University, Korea, Republic of (South Korea)
Hyojin Kim, Student, Yonsei University, Korea, Republic of (South Korea)
Soonhong Min, Professor, Yonsei University, Korea, Republic of (South Korea)

This study suggests two types of supplier development according to knowledge content and target recipients: managerial knowledge transfer and operational knowledge transfer. Hypotheses are drawn from the relational view (Dyer and Singh 1998) and tested using data from 137 small and medium-sized Korean firms and employing a hierarchical liner modeling.

060-0327 The Influence of Conflict and Governance on Trust in Buyer-supplier Relations

Sean Handley, Assistant Professor, University of Notre Dame, United States
Stephanie Eckerd, Assistant Professor, University of Maryland, United States
Fabrice Lumineau, Assistant Professor, Purdue University, United States

Inter-organizational exchange presents countless opportunities for conflict to occur. Yet, the literature on the impact and management of inter-organizational conflict is underdeveloped. In this study, we examine how integrity- and competence-based violations interact with governance mechanisms in their effect on inter-organizational trust.

318	Sunday, 09:45 AM - 11:15 AM, Parlor B	Track: Risk Management in Operations
	Session: Risk Management in Projects, Logistics Processes	
	Chair(s): Stefan Weissenboeck	

060-0602 Uncovering Links between Supply Chain Risk, Time and Cost: A Dynamic Model Applied to the Food Industry

Simone Voldrich, Student, Ecole Polytechnique, Switzerland
Philippe Wieser, Professor, Ecole Polytechnique, Switzerland

Addressing risk operationalization in complex supply chains, we show risk trade-off with time and cost following the contingency theory. With a field based methodology the new model demonstrates the concept of fit with data from food industry. The comparison of single and multi-objective models provides novel insights in risk management.

060-0042 Improvement Research of Effective Lowest Price Bid Evaluation Method of Construction Engineering Project of China

Qiyang Ding, Student, University of Science & Technology, China
Jiuchang Wei, Associate Professor, University of Science & Technology, China
Dingtiao Zhao, Professor, University of Science & Technology, China

This paper is put forward with median value as the benchmark, via optimization and validation of the median value promote the Effective of Effective Lowest Price Bid Evaluation method, and hope it is have reference value for engineering bidding practice of China.

060-1371 Managing Flexibility and Supply Chain Risk in Contact Manufacturer Networks for the Agrochemical Industry

Aaron Ratcliffe, Assistant Professor, University of North Carolina Greensboro, United States
Elliot Wolf, NA, Syngenta, United States
Vidyaranya Gargeya, Professor, University of North Carolina Greensboro, United States

Agrochemical companies outsource formulation of some products to multiple contract manufacturers (CMs) to increase flexibility managing supply disruptions, but this increases setup costs and exposes the firm to asymmetries in CM risks and capabilities. We study how to allocate production to CMs in order to balance profit and risk.

060-0458 Capacity Management for a Risk-averse Shipping Contractor under Demand and Supply Uncertainty

Belleh Fontem, Assistant Professor, University of Mary Washington, United States
Christopher Garcia, Assistant Professor, University of Mary Washington, United States

We analyze cargo capacity allocation decisions for a shipping contractor serving multiple customers under uncorrelated supply and demand uncertainty. We formulate the problem as a non-linear program, and derive bounds for various capacity allocation schemes. We experiment extensively on test instances using two meta-heuristic approaches, and extract useful managerial insights.

492	Sunday, 09:45 AM - 11:15 AM, Cabinet Session: Emerging Scholars Program 2 Chair(s): Jack Kanet	Track: Meetings & Symposiums
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060-1708 Emerging Scholars Program 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 will feature internationally recognized senior OM scholars as discussion leaders.

320

Sunday, 02:45 PM - 04:15 PM, Columbia 1

Track: Behavior in Operations Management*Session:* Impacts of Consumer Behavior and Behavioral Newsvendors*Chair(s):* Dung Nguyen**060-1343** Power on Biased Newsvendor Ordering Behavior

Sebastian Villa Betancur, Student, University of Lugano, Switzerland

Jaime Castaneda, , Massachusetts Institute of Technology, United States

Paulo Goncalves, Associate Professor, University of Lugano, Switzerland

We experimentally examine the effect of power on Newsvendors' ordering behavior. We systematically vary feelings of power through episodic priming to explore how stronger feelings of power affect typical biased ordering behavior of products of low and high profitability observed in the traditional Newsvendor model.

060-0605 Newsvendor Ordering Biases under Budget Constraints

Jaime Castaneda, , Center for Transportation & Logistics, United States

Paulo Goncalves, Associate Professor, Institute of Management, Switzerland

We experimentally examine the multi-item Newsvendor model with resource constraints, commonly known as the Newsstand model. We systematically vary a budget constraint to explore how decreasing budget levels affect typical biased ordering behavior of products of low and high profitability observed in the traditional Newsvendor model.

060-0967 Consumer Preferences for Delivery Options in Online Retailing: A Conjoint Analysis

Dung Nguyen, Student, Vrije Universiteit Amsterdam, Netherlands

Sander De Leeuw, Associate Professor, Vrije Universiteit Amsterdam, Netherlands

Wout Dullaert, Professor, Vrije Universiteit Amsterdam, Netherlands

The objective of study is to investigate the structure of consumer preferences for delivery options offered by online retailers across three types of products in the Netherlands using consumer panel data. Our results show that delivery charges consistently dominate consumer choices with speed of delivery second.

060-1623 Evolving toward a Circular Economy: The Customer's Role

Yacan Wang, Associate Professor, Beijing Jiaotong University, China

Diane Mollenkopf, Associate Professor, Tennessee State University, United States

Benjamin Hazen, Assistant Professor, Tennessee State University, United States

This study aims to examine the factors that drive a consumer's intention to switch from a legacy supply chain to a closed-loop supply chain. Pull-push-mooring theory helps form the theoretical model, which is tested empirically using survey data of consumers both in China and the United States.

321

Sunday, 02:45 PM - 04:15 PM, Columbia 2

Track: Closed Loop Supply Chains*Session:* Environmental Considerations in Operations Management*Chair(s):* Ximin Huang**060-0298** Investment in Environmental Process Improvement in Response to Regulation

Cheryl Gaimon, Professor, Georgia Institute of Technology, United States

Ravi Subramanian, Associate Professor, Georgia Institute of Technology, United States

Wenli Xiao, Assistant Professor, University of San Diego, United States

Markus Biehl, Associate Professor, York University, Canada

We analyze a firm's dynamic investment in environmental process improvement (EPI) to reduce waste and toxicity in response to penalties and subsidies. The firm's investment in EPI over time differs substantially in response to penalties versus subsidies. We contrast firm response to short-term targets versus long-term penalties for environmental impact.

060-0462 Technology Portfolios for Climate Change Mitigation: A Firm-level Study

Derek Wang, Assistant Professor, McGill University, Canada

Shanling Li, Professor, McGill University, Canada

Toshiyuki Sueyoshi, Professor, New Mexico Tech, United States

We investigate empirically the relationship between firms' environmental technology portfolio decisions and firms' characteristics using data from U.S. companies. This study shows the determinant factors behind different types of technologies and the impact of technology portfolios on the companies' performance.

060-0873 To Remarket Now or Save for Warranty Claims

Cerag Pince, Assistant Professor, Kuehne Logistics University, Germany

Mark Ferguson, Professor, University of South Carolina, United States

Beril Toktay, Professor, Georgia Institute of Technology, United States

Consumer returns constitute a substantial fraction of sales in the consumer electronics industry and often cannot be re-sold as new due to litigation concerns. This paper investigates how an OEM should price new and refurbished products while allocating consumer returns between remarketing and warranty coverage options over the product's life-cycle.

060-1155 Green Sourcing

Niyazi Taneri, Assistant Professor, SUTD, Singapore

Saif Benjaafar, Professor, University of Minnesota, United States

Xi Chen, Assistant Professor, University of Michigan Dearborn, United States

We model the interaction between a retailer and its suppliers where the retailer enjoys a premium for green-certified products; suppliers have to incur costly effort to improve their chances of getting green-certified; and the retailer can choose to offer consulting services about the certification process.

322

Sunday, 02:45 PM - 04:15 PM, Columbia 3

Track: Empirical Research in Operations Management

Session: Supply Chain Empirical Research - II

Chair(s): Penina Orenstein

060-1033 Lean Transformation across the Supply Chain: Will Burning of the Bridges Help in Initiating Sustenance?

Saideep Rathnam, Student, Indian Institute of Management Bangalore, India

Krishna Sundar Diatha, Professor, Indian Institute of Management Bangalore, India

Lean implementation has been researched extensively for over three decades. However, sustained implementation stories are few and far in between, with high rates of failure at initiation stages of implementation. This study examines successful implementations and suggests a model for lean implementation for greater success rates across the supply chain

060-1318 Good Vibrations: Lessons from Packaging for the Global Supply Chain

Peter Borocz, Assistant Professor, Szechenyi Istvan University, Hungary

Gyula Vastag, Professor, Szechenyi Istvan University, Hungary

The paper, using measurements from multiple shipments, explores challenges global supply chains face in inter-modal shipping environments. Specifically, data (e.g., vibration levels, shocks, changes of temperature and relative humidity) from truck and vessel combinations in less-than-truckload shipments across continents are analyzed to pinpoint critical points in the transportation network.

060-1537 Understanding the Topological Structure of a Supply Network Using an Empirical Approach

Penina Orenstein, Associate Professor, Seton Hall University, United States

This research harnesses the power of data from a Bloomberg terminal to develop supply chain maps for a number of key supply networks. The empirical data can then be used to explain the topology of supply networks, an important area since supply network structure affects network performance and reliability.

323

Sunday, 02:45 PM - 04:15 PM, Columbia 4

Track: Retail Operations Management

Session: Pooling, Forecasting, and Customer Behavior in Retailing

Chair(s): Masha Shunko

060-0713 Is Pooling Always Better? Evidence from a Supermarket

Jingqi Wang, Assistant Professor, The University of Hong Kong, Hong Kong

Yong-Pin Zhou, Associate Professor, University of Washington, United States

We study factors affecting cashiers' service rate using data from a supermarket. We find that customer waiting pushes cashiers to work faster. We also observe that pooling has a negative impact on cashiers' service rate.

060-0811 The Value of Social Media in Color Trend Forecasting

Youran Fu, Student, University of Pennsylvania, United States

Marshall Fisher, Professor, University of Pennsylvania, United States

Recent increases in the quality of social media data motivated us to use them to better forecast fashion trends. Our finding shows that fine-grained social media data up to 3 months ago have a significant effect on the current sales. We help a multinational fashion retailer improve their inventory management.

060-1455 Retailer's Dynamic Pricing Behaviors in the Presence of Strategic Consumers

Mirko Kremer, Professor, Frankfurt School of Finance & Management, Germany

Benny Mantin, Assistant Professor, University of Waterloo, Canada

Anton Ovchinnikov, Associate Professor, Queens University, Canada

We present experimental evidence for how human subjects who play as pricing managers dynamically price limited inventories in the presence of strategic consumers. Contrasting observed behaviors with modeling predictions we outline a number of systematic biases and explain them through a number of behavioral operations' concepts.

060-0530 Power, Risk Sharing, and Moral Hazard in Scan-based Trading: An Extension of Agency Theory

Min Choi, Student, Arizona State University Tempe, United States

Elliot Rabinovich, Professor, Arizona State University Tempe, United States

Timothy Richards, Professor, Arizona State University Tempe, United States

SBT is a growing trend in retail industry. Yet, evidence suggests that many SBT initiatives have been one-sided, contributing only to retailers' profits. This research borrows from Agency Theory to examine decoupling of inventory ownership and control that SBT entails and show how it creates opportunities for retailers' moral hazard.

324

Sunday, 02:45 PM - 04:15 PM, Columbia 9

Track: Service Operations*Session:* Panel on Innovations Service Operations Management Empirical Research*Chair(s):* Aleda Roth**060-1680** Panel on Innovations Service Operations Management Empirical Research

Sriram Venkataraman, Assistant Professor, University of South Carolina, United States

Ryan Buell, Professor, Harvard University, United States

Rohit Verma, Professor, Cornell University, United States

This interactive session addresses innovative empirical research methods in service operations management. The panelist will discuss novel methods as they have applied to their research in services, including various types of experiments (e.g., classical behavioral, video, story-board, best-worst), econometric techniques, and measurement).

325

Sunday, 02:45 PM - 04:15 PM, Columbia 10

Track: Sustainable Operations*Session:* Sustainable Technologies: Management and Policy Design*Chair(s):* Sam Aflaki**060-0275** Does Economic Growth Matter? Technology-push, Demand-pull & Endogenous Drivers of Innovation in the RE Industry

Sam Aflaki, Assistant Professor, HEC Paris, France

Syed Basher, Senior Research Fellow, Fikra Research & Policy, Qatar

Andrea Masini, Associate Professor, HEC Paris, France

We argue that in addition to the traditional push– pull dichotomy, the drivers of technological change must be differentiated by whether they are exogenous or endogenous to the economic system. We find that public R&D investments, policies supporting RE and per capita income all have a positive impact on RE diffusion.

060-0276 Impact of EPR Legislation on Selling and Leasing Strategies

Ni Fang, Student, HEC Paris, France

Andrea Masini, Associate Professor, HEC Paris, France

This paper studies how product take-back legislation affects the pricing and production strategies of firms that leases and sells products. The impact of such legislation hinges upon differences in the depreciation rates of sold and leased products and on the degree of control over the market for second-hand

060-0513 Optimal Feed-in-Tariff Policies: The Role of Supply Chain Intermediaries

Shadi Goodarzi, Student, HEC Paris, France

Sam Aflaki, Assistant Professor, HEC Paris, France

Andrea Masini, Associate Professor, HEC Paris, France

We assess the effectiveness of FIT policies in promoting renewable technologies taking into account supply chain intermediaries' decisions. Modeling a three-tire supply chain that includes potential adopters, technology manufacturers and an electricity supplier, we show that the ability of policy makers in inducing adoption is greatly affected by the intermediaries' market characteristics.

060-1057 Energy Efficiency Contracting in Supply Chains

Ali Shantia, Student, HEC Paris, France

Sam Aflaki, Assistant Professor, HEC Paris, France

Andrea Masini, Associate Professor, HEC Paris, France

This study analyses the effects of relative bargaining power in a supply chain on adoption of energy efficiency measures by the suppliers in presence of technological uncertainty. We characterize optimal contracting mechanisms in terms of EE investment and channel profit by comparing multiple arrangements actually practiced in industry.

327

Sunday, 02:45 PM - 04:15 PM, Columbia 12

Track: Purchasing and Supply Management*Session:* Cross-Cultural Research in Purchasing and Supply Management*Chair(s):* Stephanie Eckerd**060-0303** Impact of Power and Relationship Commitment on Supply Chain Integration: A Cross-cultural Analysis

Barbara Flynn, Professor, Indiana University, United States

Baofeng Huo, Professor, Zhezhiang University, China

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

We link power-relationship commitment theory with supply chain integration (SCI) to test cross-cultural differences. Survey data from China and the U.S. formed the basis for measurement invariance analysis and structural equation modeling. The analysis revealed important differences in the impact of power bases on relationship commitment, based on national culture.

060-1366 The Importance of Leadership in Developing Integrated Supply Chains

Thomas Kull, Associate Professor, Arizona State University Tempe, United States

Frank Wiengarten, Assistant Professor, Esade Business School, Spain

Damien Power, Professor, University of Melbourne, Australia

Supply chain integration (SCI) can be beneficial but unexplored is how leadership styles facilitate it. Our research explores if preference for a style of leadership enables SCI; and if leadership style preferences change how internal integration affects supplier integration? Empirically, taking a country level perspective finds interesting differences.

060-0889 The Effects of National Culture on the Leakage of Proprietary Digital Assets

Brett Massimino, Assistant Professor, Cornell University, United States

John Gray, Associate Professor, Ohio State University, United States

We relate the cultural characteristics of two organizations involved in digital product development to the propensity that the product will be leaked to unauthorized parties. We utilize longitudinal data covering video game development from the years 2000 through 2010, as well as data for a major, black-market distribution channel.

060-0304 Cultural Attitudes towards Contract Design in Supply Chain Exchanges

Stephanie Eckerd, Assistant Professor, University of Maryland, United States

Yun Shin Lee, Assistant Professor, K A I S T, Korea, Republic of (South Korea)

Dina Ribbink, Assistant Professor, University of Western Ontario, Canada

The purpose of this study is to investigate the impact of national culture on the design and effectiveness of bonus and penalty incentive contracts. We conduct laboratory experiments in Canada, China, and the Republic of Korea, and evaluate buyers' contract design decisions and suppliers' responses.

328

Sunday, 02:45 PM - 04:15 PM, Piscataway

Track: Inventory Management

Session: Optimal Policy in Inventory Management

Chair(s): Jiye Xue

060-0595 A Multi-period Inventory Control Problem with Tax Consideration

Jiye Xue, Student, Chinese Univ of Hong Kong, Hong Kong

Ke Fu, Professor, Lingnan College, Sun Yat-sen University, China

Vernon Hsu, Professor, Chinese Univ of Hong Kong, Hong Kong

We consider a finite-horizon discrete-time inventory control problem under tax consideration. The objective is to maximize the expected profit at the end of the horizon, e.g., a tax year. We show that a state-dependent base stock policy is optimal and develop a number of structural properties either analytically or numerically.

060-0089 Integrated Ordering and Pricing Policy for Perishable Products under Inventory Inaccuracy

Zheng Wang, Professor, Southeast University, China

Xue Qiao, Student, Southeast University, China

Haoxun Chen, Professor, University of Technology of Troyes, France

Random quality decay rate makes the inventory records of perishable products on various quality levels inaccurate. By calculating the probability distributions of physical inventories on different quality levels, we develop a robust integrated ordering and pricing policy based on a partially observed Markov decision process (POMDP) model of the system.

060-1131 Optimizing Inventory Replenishing, Pricing and Transshipment Management of Two Manufacturing Facilities

Jianjun Xu, Assistant Professor, Zaragoza Logistics Center, Spain

Youyi Feng, Professor, Zaragoza Logistics Center, Spain

We study the optimal dynamic inventory, pricing, and transshipment policy for a system of two manufacturing facilities that periodically replenish and sell a product to satisfy their stochastic and price-sensitive demands. We show that optimal value functions retain a structural property that enables monotone effective behavior and sensitivity analysis.

329

Sunday, 02:45 PM - 04:15 PM, Cardozo

Track: Information in Operations Management

Session: Operational Issues in Online Market

Chair(s): Ashish Agarwal

060-1000 Supplier Encroachment on an Online Intermediary

Zhuoxin Li, Student, University of Texas Austin, United States

Ashish Agarwal, Assistant Professor, University of Texas Austin, United States

Stephen Gilbert, Professor, University of Texas Austin, United States

We study a supply chain where the manufacturer can sell through its direct channel or through a retailer. The manufacturer and the retailer bid for a retail slot on an online intermediary to attract consumers to their store. Bidding and product pricing strategies are discussed.

060-1378 Understanding the Effect of Jump Bidding in Overlapping Online Auctions

Lin Hao, Assistant Professor, University of Notre Dame, United States

Yong Tan, Professor, University of Washington, United States

Arvind Tripathi, Associate Professor, University of Auckland, New Zealand

In electronic markets, overlapping online auction has emerged as a viable and efficient mechanism for large retailers desiring to clear off their excessive inventories. In this paper, using a dataset from a reputable website we empirically studied the effect of jump bidding behavior on the outcomes of overlapping online auctions.

- 060-1230** Bidding on Keyword Auctions: Advertiser's Perspective
Haldun Aytug, Professor, University of Florida, United States
Soohyun Cho, Student, University of Florida, United States

Paid search advertising enables advertisers to place targeted advertising with keywords. In this paper, we demonstrate the model for an advertiser' bidding strategies to maximize its profit when time and budget constraints exist. Moreover, we study how accumulated click information from users affects bidding patterns and profits of an advertiser.

- 060-1688** Show Me the Way To Go Home: An Empirical Investigation of Ride Sharing & Alcohol Related Motor Vehicle Homicides
Brad Greenwood , Lecturer, Temple University, United States
Sunil Wattal, Associate Professor, Temple University, United States

We use a natural experiment to establish the mechanism of Uber's entry on drunk driving. Our results show that UberX strongly and negatively affects the number of motor vehicle homicides. However, we find limited evidence to support previous claims that this holds even for higher priced Uber Black car service.

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| 330 | Sunday, 02:45 PM - 04:15 PM, Du Pont | <i>Track:</i> Humanitarian and Not-for-profit Operations |
| | <i>Session:</i> Humanitarian Logistics for Recovery and Disaster Evaluation and Provision of Basic Services | |
| | <i>Chair(s):</i> Begona Vitoriano M. Teresa Ortuno | |

- 060-0074** Improving Delivery Logistics at Not-for-Profit Organizations
Andrew Manikas, Assistant Professor, University of Louisville, United States
James Kroes, Assistant Professor, Boise State University, United States

Determining efficient delivery and pickup routes is a potentially expensive activity for organizations. These costs are often beyond the budgetary capabilities of many not-for-profit humanitarian organizations. To address this issue, this project created a spreadsheet tool that interfaces with a free online map database to quickly determine near-optimal delivery routes.

- 060-1006** Optimal Procurement Policies for Goods from Genuine and Potentially Counterfeit Sources
Laura Wagner, Student, Zaragoza Logistics Center, Spain
Mustafa Çağrı Gürbüz, Professor, Zaragoza Logistics Center, Spain
Mahmut Parlar, Professor, McMaster University, Canada

Counterfeiters leverage on shortages of genuine manufacturers to offer inferior goods to intermediaries as substitutes. In this paper, we study the intermediary's replenishment policies in markets where a trusted primary supplier is randomly disrupted while an alternative supplier offers goods with uncertain quality in a multi-period setting.

- 060-1020** Robust Heuristics for Post Disaster Road Recovery Scheduling Problem
Biket Ergunes, Student, Yeditepe University, Turkey
Linnet Ozdamar, Professor, Yeditepe University, Turkey
Dilek Tuzun Aksu, Assistant Professor, Yeditepe University, Turkey

The problem considered here involves clearing post disaster roadside debris with the goal of maximizing the cumulative accessibility of the whole network while debris is cleared. We develop a mathematical model and propose several practical and robust task selection rules that favor the goals of network accessibility and cleanup makespan.

- 060-1197** Rural Electrification: Providing Basic Services to People in Need in Remote Areas
Begona Vitoriano, Associate Professor, Universidad Complutense De Madrid, Spain
M. Teresa Ortuno, Associate Professor, Universidad Complutense De Madrid, Spain
F. Javier Martín-Campo, Lecturer, Universidad Complutense De Madrid, Spain
Luis Carrasco, Student, Technical University of Madrid, Spain
Luis Navarte, Professor, Technical University of Madrid, Spain

Underdeveloped areas in the world suffer a lack of basic services, as energy. Systems to provide it must be designed to guarantee access to such a basic service in a medium-long term. A subsidized public-private system in Morocco is shown, and a procedure for cost estimation of maintenance is presented.

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| 331 | Sunday, 02:45 PM - 04:15 PM, Embassy | <i>Track:</i> Humanitarian and Not-for-profit Operations |
| | <i>Session:</i> Crisis and disaster management | |
| | <i>Chair(s):</i> Xiaofeng Nie | |

- 060-1276** Value Stream Analysis of West African Ebola Crisis Management
Laura Laguna Salvado, Student, University of Toulouse, Mines Albi, France
Matthieu Lauras, Associate Professor, University of Toulouse, Mines Albi, France
Tina Comes, Associate Professor, University of Agder, Norway

One major issue of research works on humanitarian operations consists in developing approaches able to mix case studies and quantitative models. This work addresses this problem by proposing a field-oriented research, which aims to model and analyze qualitatively and quantitatively the Value Stream of West African Ebola Crisis Management.

- 060-1532** Optimal Allocation of Epidemic Intervention Resources with an Application to the 2014 West Africa Ebola Crisis
Eike Nohdurft, Student, Whu - Otto Beisheim School of Management, Germany

Elisa Long, Assistant Professor, University of California Los Angeles, United States

Stefan Spinler, Professor, Whu - Otto Beisheim School of Management, Germany

Containment of an epidemic disease like Ebola 2014 in West Africa relies on intervention resources. A model reducing the number of infections with the available resources is proposed. The decisions are based on a forecast of the epidemic in each region and a program optimizing the allocation of intervention resources.

060-0467 Analysis of a Regional Prepositioning Network for Crisis Response in East Africa: The Case of the UNHRD

Émilie Dufour, Student, Hec Montreal, Canada

Marie-Ève Rancourt, Assistant Professor, Université Du Québec A Montreal, Canada

Julie Paquette, Assistant Professor, HEC Montreal, Canada

The objective of this case study consists to evaluate a prepositioning network for the UNHRD in East Africa, where high demand non-food items would be stored at the regional level in Uganda. We analyze by means of simulations the potential of providing a swifter response at lower cost.

060-0666 Joint Inventory Prepositioning under Budget Constraints

Jaime Castaneda, , Massachusetts Institute of Technology, United States

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

Paulo Goncalves, Associate Professor, University of Lugano, Switzerland

Preparedness activities for emergency response face funding restrictions. Under this scenario, we experimentally explore how individuals preposition multiple emergency supplies of different cost levels under different budget scenarios, thus assessing how the degree of budget tightness affects performance.

332

Sunday, 02:45 PM - 04:15 PM, Fairchild East

Track: Healthcare Operations Management

Session: Healthcare supply chain and lean operation

Chair(s): Martin Land

060-0527 Development of a ISO 9001 Management System Model for Additive Manufacturing of Products for Medical Use

Kleber Nobrega, Professor, Universidade Potiguar, Brazil

Ketilly Yasmyne Martins, Student, Universidade Estadual da Paraíba, Brazil

Nadja Maria Brito, Professor, Universidade Estadual da Paraíba, Brazil

Rodolfo Castelo Branco, Student, Universidade Estadual da Paraíba, Brazil

Rafael Grepel, Professor, Universidade Estadual da Paraíba, Brazil

Based on a case study, this paper presents a methodology to adapt ISO 9001 standards for additive manufacturing organizations directed to printing products for medical use. Starting with a conceptual model, guidelines were identified to orientate planning and operation of the management system, as well as its maintenance and improvement

060-1165 Reducing Time and Capacity Buffers in Hospitals: Effectiveness of Lean

Martin Land, Associate Professor, University of Groningen, Netherlands

Oskar Roemeling, Student, Rijksuniversiteit Groningen, Netherlands

Kees Ahaus, Professor, University of Groningen, Netherlands

Most research assumes that Lean should ultimately result in buffer reduction. This study investigates differences in effectiveness between Lean initiatives in hospitals in a multiple-case study. Why do some initiatives lead to stronger buffer reduction than others and how does this relate to addressing the correct sources of variability?

060-1248 System to Manage the Blood Banks Stocks: An Application in the Brazilian case

Vanessa Ferreira, Student, Universidade Federal Rural do Semi Arido, Brazil

Breno Carmo, Assistant Professor, Universidade Federal Rural do Semi Arido, Brazil

Amanda Oliveira, Assistant Professor, Universidade Federal Rural do Semi Arido, Brazil

The haemotherapeutic products are produced from blood collected in the campaigns. However, there is a waste of the blood because of lack at the collections' direction. A system was developed to manage the blood collection campaigns. The results shows that the system can model the demand and support the campaigns.

060-1504 Supply Chain Risk Management and Hospital Inventory: Effects of System Affiliation

David Zepeda, Assistant Professor, Northeastern University, United States

Gilbert Nyaga, Associate Professor, Northeastern University, United States

Gary Young, Professor, Northeastern University, United States

In this study we propose a supply chain risk management (SCRM) approach in health care supply chains by empirically examining the relationship between supply chain risk and risk buffering approaches on hospital inventory cost. Results demonstrate that hospitals manage inventory as predicted by supply chain management theory.

333

Sunday, 02:45 PM - 04:15 PM, Fairchild West

Track: Production Planning and Scheduling

Session: Novel Computational Approaches in Scheduling

Chair(s): Panagiotis Repoussis

060-0235 Capacity Dilemma: Economic Scale Size versus Demand Fulfillment

Chia-Yen Lee, Assistant Professor, National Cheng Kung University, Taiwan, Republic of China

A firm tends to associate capacity planning with economic scale size and demand fulfillment for profit maximization. However, it is troublesome capacity dilemmas to achieve both of them simultaneously in stochastic environment. We propose a multi-objective stochastic programming with data envelopment analysis (DEA) constraints to find a compromise efficient benchmark.

060-0517 Cutting Stock with Sequence Dependent Set-up Times: An Application to a Large Scale Industry Problem

David Wuttke, Lecturer, Ebs Business School, Germany

Hans S Heese, Professor, Ebs Business School, Germany

Florian Gojny, Head of Business Development, SGL Technologies GmbH, Germany

We consider a two-dimensional cutting stock problem with sequence dependent set-up times, due dates, and tolerances as witnessed in textile and fiber-composite industries. To solve real-life-instances we provide a decomposition heuristic that first identifies optimal cutting patterns and then optimizes their sequence by minimizing the number of knife relocations.

060-0867 Data Quality and Production Planning

Peter Letmathe, Professor, Rwth Aachen University, Germany

Benjamin von Eicken, Student, Rwth Aachen University, Germany

We compute production plans taking different data quality aspects such as completeness, timeliness, semantic accuracy and correctness into account. The results allow to analyze costs of data quality impairments and to identify strategies reducing negative effects of using data with low quality in production planning.

060-1484 An Adaptive Crossover Genetic Algorithm for Multi-mode RCPSP with Discounted Cash Flows

Karuna Jain, Professor, National Institute of Industrial Engineering, Mumbai, India

Vijay Bilolikar, Associate Professor, Fr. C R College of Engineering, University of Mumbai India, India

This paper presents an adaptive genetic algorithm for solving a multimode resource-constrained project scheduling problem with discounted cash flows for minimizing costs. The genetic algorithm operates on two crossovers adaptively. A mathematical model is developed and detailed computational experiments are performed on a standard problem set to evaluate the performance.

060-1597 Iterated Local Search for the Flexible Job Shop Scheduling Problem with Resource Constraints

Panagiotis Repoussis, Assistant Professor, Stevens Institute of Technology, United States

Dimitris Paraskevopoulos, Lecturer, University of Bath, United Kingdom

Christos Tarantilis, Professor, Athens Univ of Econ & Bus, Greece

This work presents an Iterated Local Search for solving multi-attribute flexible job-shop scheduling problems with resource constraints. We focus on problems with unrelated parallel machines and varying consumption rates of renewable resources. The algorithm employs new compound moves and an adaptive perturbation mechanism. Experiments on benchmark data sets are reported.

335	Sunday, 02:45 PM - 04:15 PM, Gunston West	<i>Track:</i> Meetings & Symposiums
	<i>Session:</i> Corporate Session: Playing an Online Game Used to Teach Operations Management	
	<i>Chair(s):</i> Sam Wood	

060-1730 Corporate Session: Playing an Online Game Used to Teach Operations Management
Sam Wood, President, Responsive Learning Technologies, United States

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336	Sunday, 02:45 PM - 04:15 PM, Coats	<i>Track:</i> Economics Models of Operations
	<i>Session:</i> OM Studies by Marketing Faculty	
	<i>Chair(s):</i> Kinshuk Jerath Tinglong Dai	

060-0653 Impact of Inventory on Quota-bonus Contracts with Rent Sharing
Kinshuk Jerath, Assistant Professor, Columbia University, United States
Tinglong Dai, Assistant Professor, The Johns Hopkins University, United States

We study the impact of limited inventory on optimal salesforce compensation contracts. We use the framework of Oyer (2000), characterized by limited liability and rent sharing with the agent. Our results also underscore the importance of considering the inventory aspect while making salesforce compensation decisions.

060-0752 Product Line Design in the Presence of a Flat-rate Bias
Bobby Zhou, Assistant Professor, University of Maryland, United States
Debu Purohit, Professor, Duke University Durham, United States
Preyas Desai, Professor, Duke University Durham, United States

In this paper, we study how a flat rate bias affects a monopolist firm's design of its product line. We incorporate two sources of the flat rate bias: the cost of monitoring and the cost of forgone consumption. We show that firms can vary quality levels to maximize profits.

060-0855 Strategic Under-testing by Diagnostic Experts
Tinglong Dai, Assistant Professor, Johns Hopkins University, United States
Shubhanshu Singh, Assistant Professor, Johns Hopkins University, United States

Agents often rely on diagnostic experts for evaluation of the state of the world. We examine incentives of an imperfectly informed diagnostic expert to diagnose the state of the world based on her signal or advice further testing. Interestingly, the information asymmetry about the expert's ability may lead to under-testing.

- 060-1447** Service Quality, Moral Hazard and Competition in the Emerging Markets
Jian Ni, Assistant Professor, The Johns Hopkins University, United States
Fue Zeng, Professor, Wuhan University, China

The issue of moral hazard in service industry is exacerbated in the emerging market due to lack of business ethical standard and the difficulty of legal enforcement. In this study, we construct a theoretical framework to explore whether and when competition could help lessen or worsen this adverse effect.

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| 337 | Sunday, 02:45 PM - 04:15 PM, Monroe | <i>Track:</i> Product Innovation and Technology Management |
| | <i>Session:</i> Innovation and Entrepreneurship | |
| | <i>Chair(s):</i> Nitin Joglekar | |

- 060-0552** Platform Investment in Third Party Content Development
Burcu Erciyes, Assistant Professor, Tulane University, United States
Edward Anderson, Associate Professor, University of Texas Austin, United States
Geoffrey Parker, Professor, Tulane University, United States

Many two-sided platforms provide application programming interfaces (APIs). Because APIs are costly to develop, but critical to facilitate third party content development, they are strategic to the firm. We develop an analytic model to explore key trade-offs with respect to API investment, pricing, and content quality in a two-sided market.

- 060-0046** Angel Capital: Contingent Contracts for Cash and Knowhow in Early Stage Start-up Development
Sinan Erzurumlu, Associate Professor, Babson College, United States
Nitin Joglekar, Associate Professor, Boston University, United States
Moren Levesque, Professor, York University, Canada
Fehmi Tanrisever, Assistant Professor, Bilkent University, Turkey

Contracting for cash and knowhow without giving the ownership rights away through equity is a critical challenge for entrepreneurs. We develop, analyze and test an early-stage financing contract that can contingently allocate an investor's cash in return for ownership shares, while considering investor's knowhow and entrepreneur's skills for value creation.

- 060-1288** Investigating the Drivers and Consequences of Entrepreneurial Risk
Jennifer Bailey, Assistant Professor, Babson College, United States

We investigate the various factors which contribute to the appraisal of entrepreneurial risk to provide insights on the risk management strategies which should be prioritized.

- 060-0165** Technology Readiness Levels at 40: A Study of State-of-the-Art Use, Challenges and Opportunities
Alison Olechowski, Student, Massachusetts Institute of Technology, United States
Nitin Joglekar, Associate Professor, Boston University, United States
Steven Eppinger, Professor, Massachusetts Institute of Technology, United States

NASA developed Technology Readiness Levels (TRLs) in the 1970s as metrics for assessing technology maturity. Since then, TRLs have become the basis for technology adoption and oversight decisions in many industries. We explore state-of-the-art TRL implementation practices at seven organizations and identify opportunities for research to improve TRL methods.

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| 338 | Sunday, 02:45 PM - 04:15 PM, Holmead East | <i>Track:</i> Operations Management Practice |
| | <i>Session:</i> Lean Manufacturing and Continuous Improvement | |
| | <i>Chair(s):</i> Torbjorn Netland | |

- 060-0146** Continuous Improvement Project Selection and Execution
Daniel Bumblauskas, Assistant Professor, University of Northern Iowa, United States
Brad Meyer, Associate Professor, Drake University, United States

Continuous improvement (CI) projects follow unique selection, deployment, and tracking processes. CI projects often are classified as business improvement initiatives (BPIs), lean / six sigma projects, etc. A survey and interview script were developed and data on CI projects have been collected from numerous companies across various industry segments.

- 060-0289** Using Adapted Budget Cost Variance Techniques to Measure the Impact of Lean – Based on Empirical Findings in Lean Case Studies
Thomas Kristensen, Assistant Professor, Aalborg University, Denmark

Lean is dominating management philosophy, but the management accounting techniques that best supports this is still not fully understood. Especially how Lean fits traditional budget variance analysis, which is a main theme of every management accounting textbook. I have studied three Scandinavian excellent Lean performing companies and their development of budget variance analysis techniques. Based on these empirical findings techniques are presented to calculate cost and cost variances in the Lean companies. First of all, a cost variance is developed to calculate the Lean cost benefits within the budget period by using master budget standards and updated standards. The variance between them represents systematic Lean cost improvements. Secondly, an additional cost variance calculation technique is introduced to assess improved and systematic cost variances across multiple budget periods. This is needed in Lean as the benefits are often created over multiple periods and not just within one budget period. Traditional cost variance techniques are not able to trace these effects. Moreover, Time-driven ABC is adapted to fit the measurement of Lean improvement outside manufacturing and facilitate the requirements of Lean companies. In general all these developments should enhance the measurement of cost improvements on both direct costs and indirect costs made by implementing Lean. The adaptations and techniques presented can be used by other Lean companies, because they are highly applicable and can easily be replicated. I have formalized the findings to make the accessible for researchers and practitioners.

060-0361 Implementing Lean: The Role of Takt Time and Market Variability
Torbjørn Netland, Assistant Professor, NTNU, Norway
Kasra Ferdows, Professor, Georgetown University, United States

We hypothesize that the implementation of lean is more difficult in factories with longer average cycle times (or takt times) and greater variability (due to production processes or demand volumes). We use empirical data from implementation of a lean program in factories of a large multinational to test this hypothesis.

339	Sunday, 02:45 PM - 04:15 PM, Holmead West	<i>Track:</i> Supply Chain Management
	<i>Session:</i> Practical Issues in Supply Chains II	
	<i>Chair(s):</i> Carlos Arredondo	

060-1081 Energy Supply Chain Design: A Dynamic Model for Economic Prosperity and Sustainability
Kwon Gi Mun, Student, Rutgers University, United States
Raza Rafique, Student, Rutgers University, United States
Yao Zhao, Associate Professor, Rutgers University, United States

The model addresses the long standing concern by determining the optimal way to build up an energy supply chain strategically under limited budget for energy security and economic prosperity. Applying the model to Pakistan's real life situation, we show that the solutions drastically differ from the government's plan.

060-1147 Energy Supply Chain Design: Future Energy Security of Pakistan
Kwon Gi Mun, Student, Rutgers University, United States
Raza Rafique, Student, Rutgers University, United States
Yao Zhao, Associate Professor, Rutgers University, United States

Pakistan is experiencing 25-40% shortfall of electricity supply that hampers economic growth. We test an integrated system of sourcing, generation, transmission, unique economics, and trade-offs. It provides a guideline to ensure the future energy security of Pakistan.

060-0198 Participation of SCM Strategy in the Definition of Business Strategy and its Further Conditions for Operationalization
Carlos Arredondo, Professor, Universidad Católica Argentina, Argentina
José Antonio Alfaro Tanco, Professor, Universidad de Navarra, Spain

Retrospective review from the origins through the evolution of SCM. This will permit us to determine its correct scope. Analyzing the strategic importance of SCM lead us to explore how SCM strategic participates in the business strategy. In this paper we present SCM as a business philosophy.

060-1416 The Impact of Supply Chain Initiatives in the Business Core
Gurkan Akalin, Assistant Professor, Eastern Illinois University, United States
Zhentu Huang, Student, Eastern Illinois University, United States

We are surveying the schools that introduced classes related to SCM in their core business classes. How this changes influence the program in terms of student satisfaction, employment, enrollment, and salaries?

340	Sunday, 02:45 PM - 04:15 PM, Kalorama	<i>Track:</i> Supply Chain Management
	<i>Session:</i> Empirical Research in Supply Chain Management	
	<i>Chair(s):</i> John Gray	

060-1170 Sustainable Outputs versus Sustainable Outcomes: A New Supply Chain Perspective?
Wendy Tate, Associate Professor, University of Tennessee Knoxville, United States
Lydia Bals, Professor, University of Applied Sciences, Germany

Sustainable Supply Chain Management research still allows the classic economic perspective to dominate, although triple bottom line is accepted. Case studies of social businesses are presented, extracting basic supply chain model types and the involvement of stakeholders. These models reveal innovative approaches that enable positive economic, social and ecological impacts.

060-1460 The Antecedents of a Firm's Supply Chain Disruption Intensity
Siddharth Rastogi, Student, Ohio State University, United States
John Gray, Associate Professor, Ohio State University, United States

Firms are increasingly concerned with supply chain disruptions and ways to mitigate their intensity. However, firms still wish to stay “lean” and integrated across their supply chains. As such, we explore the relationship between factors such as Supply Chain Integration and Coupling on disruption intensity.

060-1129 Revisiting the Newsvendor Model Using Prospect Theory

Chirag Surti, Assistant Professor, University of Ontario Institute of Technology, Canada

Dina Ribbink, Assistant Professor, University of Western Ontario, Canada

The literature is divided in its application of prospect theory to the Newsvendor model. Elaborating on this problem in a behavioural experiment, we explore the theoretic application further and develop managerial implication. Specifically, we explore the role of salvage value and learning on the Newsvendor’s behaviour.

341

Sunday, 02:45 PM - 04:15 PM, Jay

Track: Supply Chain Management

Session: Literature Reviews in Supply Chain Management

Chair(s): Hugo Yoshizaki

060-0168 What is the Importance of Data Mining for Logistics and Supply Chain Management? A Bibliometric Review

Roberto Fray da Silva, Student, Universidade De Sao Paulo, Brazil

Carlos Eduardo Cugnasca, Professor, Universidade De Sao Paulo, Brazil

Hugo Yoshizaki, Associate Professor, University of São Paulo, Brazil

Isabel Praça, Professor, Instituto Politécnico do Porto, Portugal

Data mining extracts knowledge from big volumes of data. Bibliometry was used to identify journals, papers, authors and events that applied it to logistics and supply chain management from 2000 to 2014. 255 relevant documents were found and analyzed. Three clusters were identified: theory development, market-oriented solutions, and theory application.

060-1016 Supply Chain Management Practices: A Classification Based on the Literature Review

Guilherme Frederico, Professor, Federal University of Paraná, Brazil

Thamires Souza, Student, Federal University of Paraná, Brazil

Researches focused on supply chains have gained relevance from 1990’s due to the opportunities of adding value to the companies through SCM - Supply Chain Management. The correct understanding of practices applied on this management is very important to obtain a better performance in a supply chain. Thus, this study will present the practices that can support companies achieving higher level of maturity in their supply chain management. As research method a systematic literature review was adopted aiming to identify practices for SCM proposed in the literature. The main contribution of this paper is to propose a classification of these practices in terms of supply chain management dimensions.

060-1039 The Application of Social Capital Theory in Supply Chain Relationships: A Systematic Literature Review

Mohammad Alghababsheh, Student, Brunel University, United Kingdom

David Gallear, Reader, Brunel University, United Kingdom

In the recent few years social capital theory (SCT) has become an important theoretical underpinning in examining supply chain relationships. This paper provides a systematic literature review of 34 applications of SCT in supply chain relationships. The paper identifies important future research avenues for scholars and implications for practice development.

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Sunday, 02:45 PM - 04:15 PM, Morgan

Track: Supply Chain Management

Session: Supply Chain Coordination 3

Chair(s): Min Yu

060-0601 Phased Rationing Mechanism and Order Policy Parameters for Divergent Supply Chains Operating with (R,S) Policy

Kurian John, Student, Indian Institute of Technology Madras, India

Rajendran Chandrasekharan, Professor, Indian Institute of Technology Madras, India

Hans Ziegler, Professor, University of Passau, Germany

We consider a divergent supply chain operating with multiple retailers and a distributor. We propose a phased rationing mechanism to distribute the on-hand inventory of the upstream member. Optimal as well as heuristic solution methodologies to obtain order policy parameters and rationing quantities for the problem are proposed.

060-0649 One Customer with Large Demand or Multiple Customers with Smaller Demands: A Service Level Agreement Perspective

Osama Alamri, Student, Royal Melbourne Institute of Technology, Australia

Babak Abbasi, Senior Lecturer, Royal Melbourne Institute of Technology, Australia

James Minas, Assistant Professor, Wilfrid Laurier University, Canada

Doug Thomas, Professor, Penn State University University Park, United States

Seyedeh Hosseinfard, Reader, Royal Melbourne Institute of Technology, Australia

We analyze the finite horizon fill rate for a supplier that exercises a base stock policy and has multiple independent/dependent customers each with their own service level agreement. We compare the case of having one customer with large demand with the case of having multiple customers with smaller demands.

060-0676 Fashion Supply Chain Network Competition with Ecolabelling

Anna Nagurney, Professor, University of Massachusetts Amherst, United States

Min Yu, Assistant Professor, University of Portland, United States

Jonas Floden, Senior Lecturer, University of Gothenburg, Sweden

We capture the individual profit-maximizing behavior of the fashion firms which incur ecolabelling costs with information associated with the carbon footprints of their supply chains revealed to the consumers. Consumers, in turn, reflect their preferences for the branded products of the fashion firms through their demand price functions.

- 060-0701** A Relational View to Collaborative Forecasting in the Food Supply Chains
Can Eksoz, Assistant Professor, Brunel Business School, London, UK, Great Britain
Afshin Mansouri, Senior Lecturer, Brunel Business School, London, UK, Great Britain
Michael Bourlakis, Professor, Cranfield University, United Kingdom
Emel Aktas, Senior Lecturer, Cranfield University, United Kingdom

We take a relational view to Collaborative Forecasting (CF) as a source of inter-organizational competitive advantage in the food industry. Analyzing survey data of 105 food manufacturers through PLS-SEM, we identify the factors that are vital for CF to generate relational rent for the manufacturers of time-sensitive food products.

343

Sunday, 02:45 PM - 04:15 PM, Northwest
Session: Pricing and Externalities
Chair(s): Goker Aydin

Track: Revenue Management and Pricing

- 060-0166** Pricing for a Multinomial Logit Model with Network Effects
Chenhao Du, Student, University of Minnesota, United States
William Cooper, Professor, University of Minnesota, United States
Zizhuo Wang, Assistant Professor, University of Minnesota, United States

We consider an extension of the classical MNL assortment pricing problem to network goods. For such network goods, the overall purchase quantities are not an explicit function of the prices. Rather, they arise as an equilibrium. We describe the solution of the assortment pricing problem and discuss some insights.

- 060-1138** Mass Customization, Externalities, and Guardrail Products: "You Can't Be All Things to All People"
Eren Cil, Assistant Professor, University of Oregon, United States
Michael Pangburn, Associate Professor, University of Oregon, United States

Firms employ mass customization to precisely match diverse customer tastes. We additionally consider the brand-level issue of mismatch between such individuals' tastes and the firm's full range of customized products. We show that the resulting mass customization region, even when costless to the firm, is bounded and includes "outlier" products.

- 060-1381** Learning, Revising, and Forgetting Multidimensional Contextual Features to Optimize Online Ad Selection
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.

- 060-0167** Price Competition under Social Comparison
Ming Hu, Assistant Professor, University of Toronto, Canada
Yun Zhou, Student, University of Toronto, Canada

We consider a duopolistic price competition of differentiated substitutable products under demand uncertainty, in which the duopoly socially compare with each other. Without social comparison, the game reduces to competitively setting prices under a deterministic demand system. We demonstrate how social comparison subject to demand uncertainty changes the competitive behavior.

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Sunday, 02:45 PM - 04:15 PM, Oak Lawn
Session: Vehicle Routing, Railroad, and Long-Haul Shipping Decisions
Chair(s): Natalie Simpson

Track: Scheduling and Logistics

- 060-1410** Optimal Route Planning and Scheduling of Long-haul Freight Shipments
Chinmoy Mohapatra, Student, University of Texas Austin, United States
Anantaram Balakrishnan, Professor, University of Texas Austin, United States

We study the problem of assigning shipments to scheduled freight transport services that share common capacitated resources. At each node, shipments using same outbound service are assigned in a first-in first-out order. We discuss modeling and algorithmic enhancements to solve this large-scale optimization problem, and present results for actual instances.

- 060-1617** Carrier Portfolio Management for Shipping Seasonal Products
Tao Lu, Student, Hong Kong University of Science & Tech, China
J. Fransoo, Professor, Technische Universiteit Eindhoven, Netherlands
Chung-Yee Lee, Professor, Hong Kong University of Science & Tech, China

We study a newsvendor-type shipper who transports and sells seasonal products to overseas market where the selling price declines over time. Shipping services differ in speed and freight rates. We show that using a combination of fast and slow services helps reduce the effect of demand uncertainty.

060-1019 Multi-objective Routing with Real Life Constraints

Vignesh Raja Swaminathan, Student, Indian Institute of Technology Madras, India

Rajendran Chandrasekharan, Professor, Indian Institute of Technology Madras, India

Sivanandan R, Professor, Indian Institute of Technology Madras, India

We develop an algorithm to determine a route in a network by considering multiple objectives such as total distance and total time. This algorithm can handle more realistic constraints like one-way traffic and time dependent travel time. Further, we test the proposed algorithm for a large network of Chennai city.

060-0775 Effect of Time Windows on Green Vehicle Routing

M. S. Gajanand, Assistant Professor, Indian Institute of Management Tiruchirappalli, India

T. T. Narendran, Professor, Indian Institute of Technology Madras, India

We present mathematical models and algorithms for routing vehicles when every pair of nodes is connected by multiple routes, with due consideration to parameters specific to each route and vehicle in order to account for the fuel consumed. An analysis with hard and soft time-windows for delivery shows interesting observations.

060-1128 Trajectory-based Modeling of Rail Yard Operations

Natalie Simpson, Associate Professor, Suny At Buffalo, United States

Railroad classification yards are joint dis-assembly and re-assembly operations that enable flow of freight across rail networks. In this simulation study, we adapt and assess the concept of trajectory-based planning to govern this complex process, allowing robust operation independent of inbound information.

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Sunday, 04:30 PM - 06:00 PM, Columbia 2

Track: Closed Loop Supply Chains*Session:* Managing Consumer Returns in a Closed-Loop Supply Chain*Chair(s):* Yue Cheng**060-0316** False Failure Returns: An Experimental Investigation of Supply Chain Coordination

Yue Cheng, Student, Penn State University University Park, United States

Brent Moritz, Assistant Professor, Penn State University University Park, United States

Daniel Guide, Professor, Penn State University University Park, United States

To reduce false failure returns, prior research has proposed a target rebate contract to coordinate the closed-loop supply chain. We modify the model to account for the best response to a proposed contract. We conduct two experiments, and observe sub-optimal coordination caused by midpoint bias and inequality aversion.

060-0812 Improvement of Remanufacturing Profitability through Controlling the Return Rate: Consumer Behavior Aspect

Ardeshir Raihanian Mashhadi, Student, University at Buffalo, SUNY, United States

Sara Behdad, Assistant Professor, University at Buffalo, SUNY, United States

The profitability of remanufacturing activities is affected by the uncertainty in returns rate. The return rate and time depend on consumer behavior. An Agent Based Simulation has been developed to analyze motivational policies which policy makers and manufacturers can adopt to influence consumer's behavior toward discarding their used items.

060-0101 Accurate Response with Refurbished Consumer Returns: Optimizing the Return Rate

Marc Reimann, Professor, University of Graz, Austria

Weihua Zhang, Assistant Professor, University of Graz, Austria

The optimal rate of returns is a key question associated with consumer returns. To account for the optimal choice of effort to reduce the return rate we extend our previous accurate response model and show how the optimal effort depends on the disposition possibilities associated with the consumer returns.

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Sunday, 04:30 PM - 06:00 PM, Columbia 3

Track: Empirical Research in Operations Management*Session:* Case Studies, Reviews, and Surveys*Chair(s):* Yunsik Choi**060-1148** Green Innovation and Firm Performance: A Case Study of the Liner Shipping Industry

Michael Ng, Student, The Hong Kong Polytechnic University, China

Venus Lun, Assistant Professor, The Hong Kong Polytechnic University, China

Kee-hung Lai, Associate Professor, The Hong Kong Polytechnic University, China

T.C.E. Cheng, Professor, The Hong Kong Polytechnic University, China

This study aims to investigate the relationship between green innovation (GI) and firm performance. We develop a model for providing a foundation for the GI adoption. We then present a case of a Danish mega-carrier to illustrate the application of the model, and discuss the performance implications of GI adoption.

060-1445 Treatment of Variability in OM Topics: Survey and Research Potential

Milind Padalkar, Student, Indian Institute of Management Kozhikode, India

Saji Gopinath, Professor, Indian Institute of Management Kozhikode, India

Variability is seen as negatively affecting the desired outcomes in many OM fields. A large body of solutions to address variability exists in literature. Yet, how variability is treated across many OM fields has not been systematically studied. This paper surveys such methods and reports cross-applicability and further research potential.

060-1223 Influence of Middle Management on Team Problem-solving capability: A Literature Review

Yunsik Choi, Student, Clemson University, United States

Lawrence Fredendall, Professor, Clemson University, United States

Aleda Roth, Professor, Clemson University, United States

In team based organizations middle managers' interactions with a team directly affect team performance. We provide a comprehensive literature review of middle management and team problem solving as a first step towards an empirical investigation.

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Sunday, 04:30 PM - 06:00 PM, Columbia 4

Track: Retail Operations Management*Session:* Supply Chain Inventory Management in Retailing*Chair(s):* Sandra Transchel**060-0220** An Empirical Comparison of Demand Models in Food Retail

Stefan Minner, Professor, Technische Universität München, Germany

Anna-Lena Sachs, Assistant Professor, University of Cologne, Germany

We test different demand models with customer number and transaction size distributions for a variety of food products and different stores. The comparison shows the advantage of a new compounded distribution compared to classical normal or negative binomial demand models and we further analyze the impact of serial demand correlation.

060-0677 Base-stock Policy in a Two-echelon Inventory System with Lost Sales

Marco Bijvank, Assistant Professor, Haskayne School of Business, Canada

A two-echelon inventory system with a central warehouse and multiple retail locations is studied. A balanced stock rationing policy is used for stock-outs at the DC, whereas excess demand in stores is lost. A heuristic procedure is developed to set the replenishment base-stock levels based on service level constraints.

060-1125 Coordination of Service Level and Shelf Life Agreements in Perishable-product Supply Chains

Sandra Transchel, Associate Professor, Kuehne Logistics University, Germany

We study contracts in two-stage perishable-product supply chains including service level and shelf-life agreements which guarantee remaining shelf-life to the retailer. Manufacturers have an incentive to produce larger batches that negatively impact remaining shelf-lives. We investigate the impact of service level and shelf-life agreement on supply chain performance and efficiency.

060-1255 Effect of Inventory Leanness on Retailers Efficiency

Howard Hao-Chun Chuang, Assistant Professor, National Chengchi University, Taiwan, Republic of China

Rogelio Oliva, Associate Professor, Texas A&M University College Station, United States

Gregory Heim, Associate Professor, Texas A&M University College Station, United States

Yating Feng, Student, Texas A&M University College Station, United States

Pursuing "lean retailing," US retailers have made efforts to reduce inventory levels., it is not clear, however, what the impact of this reduction is on sales. We empirically assess the impact of inventory leanness on retailer operating efficiency by performing a stochastic frontier analysis of a sample of U.S. retailers.

060-0699 Optimizing Case-pack Sizes in Bricks-and-Mortar Retailing

Heinrich Kuhn, Professor, Catholic University of Eichstaett-Ingolstadt, Germany

Thomas Wensing, Dr., INFORMS AG, Germany

Michael Sternbeck, Lecturer, Catholic University of Eichstaett-Ingolstadt, Germany

A Markov Chain model is developed quantifying instore logistics processes and costs related to the chosen case pack size (CP). We apply the model on a real case study of a retail chain that operates almost 3,000 stores in Europe and determine cost-optimal CP sizes for several distinctive product-store combinations.

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Sunday, 04:30 PM - 06:00 PM, Columbia 9

Track: General Track

Session: Panel: Excellence and Innovation for Business Transformation

Chair(s): Sunil Mithas

060-1690 Excellence and Innovation for Business Transformation

Sunil Mithas, Professor, University of Maryland, United States

Henry Lucas, Professor, University of Maryland, United States

Karim Lakhani, Associate Professor, Harvard Business School, United States

Harry Hertz, , National Institute of Standards and Tech, United States

This panel will discuss the role of innovation, information technology and complementary organizational initiatives such as business excellence in shaping transformations and economic success. We expect that the presentations and conversations will help to develop a more complete understanding to transform globally distributed firms and organizations.

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Sunday, 04:30 PM - 06:00 PM, Columbia 10

Track: Sustainable Operations

Session: Implementation of Sustainable Logistics Practices

Chair(s): Vanessa Pinsky

060-0829 Sustainable Transportation in Brazil: Are the Public Policies Really Driving the Diffusion of Eco-innovations?

Vanessa Pinsky, Student, Universidade De Sao Paulo, Brazil

Isak Kruglianskas, Professor, Universidade De Sao Paulo, Brazil

The research analyzes the process to implement eco-innovation manufacturing projects based on biofuel/clean technologies. The case study presents the challenges and opportunities faced by Scania in the adoption and diffusion of eco-innovations in the Brazilian market. The results explain how different public policy instruments are driving or discourage some initiatives.

060-0011 Smart and Sustainable Delivery Operations for a Large Supermarket Chain

Shong-lee Su, Professor, Soochow University, Taiwan, Republic of China

This paper reports the transformation of the delivery operations of a large supermarket chain from a traditional multi-echelon distribution network to a smart cross-docking direct-to-store network. The sustainable effects due to the transformation are also assessed in this study.

060-0499 The Brazilian Heuristic and Environmental Law through Reverse Logistics Management for Sustainable Transport

Washington Luiz Soares, Student, UNISANTOS, Brazil

Luciano Souza, Professor, UNISANTOS, Brazil

Getulio Akabane, Retired, CEETEPS, Brazil

Sustainable transport can be punctuated by reverse logistics, which is necessary to discard in terms of solid waste, to rationalize the externalities created by consumer behavior in public procurement, which is expected to be organizational changes geographic positioning with a view to international scientific convictions on Climate Change.

060-0015 Study for Reducing the Logistics Environmental Impact Drainage of Liquid Hydrocarbon Line

Gilberto Mourao, Student, Centro Paula Souza, Brazil
Hamilton Pozo, Retired, Centro Paula Souza, Brazil
Getulio Akabane, Retired, CEETEPS, Brazil
Vicente Sinkunas, Student, Centro Paula Souza, Brazil
Julia Barreto, Student, Centro Paula Souza, Brazil

This research aims to reduce the environmental impact by eliminating occasional spills on logistics pipeline transportation of liquid hydrocarbons. Additionally, the company and its principles of operational excellence, avoids costs of product and reprocessing, which generates a significant annual savings.

060-0004 E-Vehicles in the Last-mile Distribution

Hella Abidi, Student, FOM University of Applied Sciences, Germany
Sabrina Gries, Student, University of Duisburg Essen, Germany
Matthias Klumpp, Professor, FOM University of Applied Sciences, Germany
Stephan Zelewski, Professor, University of Duisburg Essen, Germany
Alessa Muenchow, Student, University of Duisburg Essen, Germany

The objective of this research paper is to identify changes in costs and operational processes caused by the use of electric trucks in the last-mile distribution of retail and logistics companies. Based on action research in four companies (DHL, Noweda, Handelshof, Zentek) in Germany we provide managerial insights which processes have to be adjusted as well as a process model and cost accounting scheme.

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Sunday, 04:30 PM - 06:00 PM, Columbia 11

Track: Sustainable Operations

Session: The Impact of Organizational Decisions on Sustainability

Chair(s): Mehmet Yalcin

060-0781 Why Maximising TBL is an Unachievable Target : An Explanation Based on Game Theory and Utility Model

Ayesha Wadood, Student, Lahore University of Management Sciences, Pakistan

The identified benefits of TBL and ways to accomplish it have little value if it is unachievable. This paper uses game theoretic framework and utility based model to demonstrate that despite that maximized "shared value" is higher than "Individual values," rational and opportunist individuals will never seek to maximize TBL.

060-1201 The Role of Operations Strategy in Corporate Sustainability: An Empirical Study

Ajaya Swain, Assistant Professor, St. Mary'S University, United States

Tradeoffs and conflicts between achievement of economic prosperity, environmental integrity, and social responsibility have made the sustainability issue complex, multifaceted, and challenging for the corporates. While researchers have argued that corporate sustainability strategies can contribute to the competitive advantage of a firm, in the context of operations management, relatively less attention has been given to the role of operations strategy on the sustainability drives of a firm and its interface with corporate sustainability strategies. Integrating these disparate streams of research, we empirically investigate the impact of an alignment between corporate sustainability strategy and operations strategy of a firm on its sustainability performance. The findings of this study can potentially provide significant implications for operations management researchers and practitioners.

060-1221 Exploring Firms' Strategic Responses to Sustainability from SCM Perspective: Competitive Advantage or Burden

Mehmet Yalcin, Student, University of Rhode Island, United States

Depending on a variety of supply chain management related factors, sustainability phenomenon could either be perceived as a strategic resource that can be embraced and leveraged by a firm or a burden that the firm has to tackle or eliminate based on the market segment(s) that the firm is servicing.

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Sunday, 04:30 PM - 06:00 PM, Columbia 12

Track: Purchasing and Supply Management

Session: Supply Chain Risk Management and Security

Chair(s): Xenophon Koufteros

060-0224 Optimal Sourcing Decisions and Information Sharing under Multi-tier Disruption Risk

Jiho Yoon, Student, Michigan State University, United States
Sri Talluri, Professor, Michigan State University, United States
Claudia Rosales, Assistant Professor, Michigan State University, United States

We consider a three-tier supply chain consisting of a manufacturer and two suppliers. Both suppliers may experience disruptions; the effect of disruption risk on manufacturer's sourcing decisions is analyzed. We study the value of information and identify conditions under which the first-tier supplier is willing to share second-tier supplier information

060-1352 Identifying Best Supply Chain Security Practices: A Taxonomic Approach

Guanyi Lu, Assistant Professor, Oregon State University, United States
Johnny Rungtusanatham, Professor, Ohio State University, United States

While supply chain security (SCS) is important to global supply chains, there is a lot of confusion in deciphering which practices can differentiate performance. After a literature search and several interviews, we identified a set of SCS practices that can potentially explain variation in performance and undertake a taxonomic approach.

060-0547 Follow the Leader: Spillover Effects of Product Recalls?

Kaitlin Wowak, Assistant Professor, University of Notre Dame, United States

George Ball, Student, University of Minnesota, United States

Jason Miller, Assistant Professor, Colorado State University Fort Collins, United States

Using a panel dataset of all automotive recalls in the United States, from 1966 to 2014, we investigate the “spillover” effect among auto recalls and examine the stock market benefits of announcing a recall following a similar recall announcement by a competitor firm.

060-1163 The Role of Coercive Pressures and Top Management Commitment in the Adoption of Security Practices

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

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

Srinivas Talluri, Professor, Michigan State University, United States

We study how coercive pressures (from government and customers) interact with top management commitment to affect the adoption of supply chain security practices.

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Sunday, 04:30 PM - 06:00 PM, Piscataway

Track: Inventory Management

Session: Pooling in Inventory Management

Chair(s): Zihan Zhou

060-0236 Risk Pooling under Price and Demand Uncertainty

Refik Gullu, Professor, Bogazici University, Turkey

Nesim Erkip, Professor, Bilkent University, Turkey

We consider purchasing and distribution decisions for a commodity whose price is random and correlated with its demand. A model, where the purchasing decisions of demand locations are pooled, is proposed. We obtain the optimal purchase quantity, time and quantity of allocation, and quantify the benefits of pooling price risk.

060-0044 The Integration of Online and Offline Channels

Zihan Zhou, Student, Nanyang Technological University, Singapore

Qinan Wang, Associate Professor, Nanyang Technological University, Singapore

We study a periodic review order-up-to policy for a two-echelon dual-channel system. The upper echelon satisfies online demand and replenishes the lower echelon while the lower echelon fulfills walk-in demand. In case of shortage, demand shift is considered. We evaluate the cost and characterize the optimal policy analytically and numerically.

060-1150 Multi-channel Inventory Control

Arjan Dijkstra, Student, Rijksuniversiteit Groningen, Netherlands

Kees Jan Roodbergen, Professor, Rijksuniversiteit Groningen, Netherlands

Marco Bijvank, Assistant Professor, University of Calgary, Canada

An e-commerce channel and a brick-and-mortar stores channel both need to fulfill customer orders. We study how to balance inventories between and the channels, taking differences between them into account. Examples of such differences are cost parameters, lead times to customers and customer reactions to stock outs.

358

Sunday, 04:30 PM - 06:00 PM, Cardozo

Track: Information in Operations Management

Session: Role of Information in Network Competition and Formation

Chair(s): Yonghua Ji

060-0817 Intra-firm Coordination of Marketing and IT under Dynamic Inter-firm Competition in Electronic Retailing

Dengpan Liu, Associate Professor, Iowa State University, United States

Subodha Kumar, Professor, Texas A&M University College Station, United States

Vijay Mookerjee, Professor, University of Texas Dallas, United States

This study examines the issues of intra-firm coordination of Marketing and IT under dynamic inter-firm competition in electronic retailing. We find that firms can be better off not adopting any intra-firm coordination under competition. Also, firms can be better off participating in a closed-loop game versus a open-loop game.

060-0949 Some New Insights on the Friendship Network and P2P Microloan Market

Sirong Luo, Associate Professor, Shanghai University of Finance and Economics, China

Yonghua Ji, Associate Professor, University of Alberta, Canada

We study the interaction between personal financial behavior and the social friendship network. Specifically, we analyze how the personal past borrowing and lending behaviors impact his role in the social friendship network. Using real P2P Microloan data, we empirically investigate the dynamic of social friendship network and provide new insights.

060-1021 A Decision Support System for Designing Tasks in Crowdsourcing Contests

Jiahui Mo, Assistant Professor, Nanyang Technological University, Singapore

Sumit Sarkar, Professor, University of Texas Dallas, United States

Crowdsourcing contests are very ubiquitous nowadays. How to design a task to attract proper solvers has been realized as an important question for seekers. To assist in task designing procedure, this research builds a decision support system which will predict how capable and experienced solvers the designed task will attract.

060-1256 A Scalable Graphic Model Method for Brand Reputation Assessment in Social Networks

Kunpeng Zhang, Assistant Professor, University of Illinois at Chicago, United States

Social media has become a popular platform that connects people who share information, in particular personal opinions. Knowing the reputation of social network entities can help develop better strategies for election campaigns or new product advertisements. We propose a scalable model to collectively measure reputations of entities in social networks.

359

Sunday, 04:30 PM - 06:00 PM, Du Pont

Track: Humanitarian and Not-for-profit Operations

Session: Not-for-Profit Operations Management

Chair(s): Kate Hughes

060-0382 Planning for Future Epidemics Using Evidence and the Haddon Matrix

Azrah Azhar, Student, George Washington University, United States

Miguel Lejeune, Associate Professor, George Washington University, United States

This paper proposes the retrospective use of evidence from a past epidemic to plan for future epidemic scenarios in developing countries. The Haddon matrix is introduced as a tool to analyze decision options relevant to stakeholders. The past epidemic evidence is based on Haiti's cholera outbreak of 2010.

060-0203 Intellectual Capital in Humanitarian Relief Organizations

Cigdem Ataseven, Assistant Professor, Cleveland State University, United States

Anand Nair, Professor, Michigan State University, United States

Mark Ferguson, Professor, University of South Carolina, United States

Humanitarian relief organizations rely heavily on intellectual assets to function effectively in resource constrained environments. In this study, we investigate the antecedents of supply chain integration (SCI) using survey data from a sample of food banks. We also test a model to see how SCI impacts performance in this context.

060-0429 Stakeholder Pressure, Relational Orientation, and Collaborative Performance: An Empirical Study of Int. NGOs

Mohammad Moshtari, Lecturer, Hanken School of Economics, Finland

Drawing from stakeholder theory and trust-commitment theory, I first investigate the relative efficacy of stakeholder pressure and relational orientation influencing the scope and level of partners' engagement in collaborative efforts. Second, I explore the benefits of engagement in collaborative relationships from operational and strategic aspects.

060-0853 "The Big Issue" - A Supply Chain Providing Social Change

Kate Hughes, Student, Greenwich University, Australia

Supply chains may be used to address social problems in the community by providing solutions to issues not addressed by businesses and government departments. This study investigates "The Big Issue", a social enterprise that since 1991 has provided a solution for homeless unemployed individuals through a unique collaboration with journalists.

060-1303 What Drives Successful Homesharing Matches? A Longitudinal Study

Carolyn Bonifield, Associate Professor, University of Vermont, United States

Marilyn Lucas, Associate Professor, University of Vermont, United States

Jie Zhang, Assistant Professor, University of Vermont, United States

Homesharing arrangements create win-win by matching affordable housing seekers with elderly home owners (i.e., providers). This longitudinal study investigates the patterns and critical successful factors of matches made by a non-profit homesharing organization in US, and explores the antecedents of the collective efficacy of the seeker-provider dyad.

361

Sunday, 04:30 PM - 06:00 PM, Fairchild East

Track: Healthcare Operations Management

Session: Health IT and technology

Chair(s): Carrie Queenan

060-0028 Does IT Help Improve Experiential Quality in Complex Service Operations? A Multi-level Empirical Investigation

Xiaosong (David) Peng, Assistant Professor, University of Houston, United States

Yuan Ye, Student, University of Houston, United States

Xin Ding, Assistant Professor, University of Houston, United States

Drawing on service operations literature and organizational information processing theory, this study examines the effects of two types of organizational complexity, i.e., detail complexity (service range) and dynamic complexity (case mix index) on patient experiential quality. The study also investigates how clinical and administrative information technology help mitigate these potential effects.

060-1564 Healthcare Process Discovery and Visualization

Rahul Basole, Associate Professor, Georgia Institute of Technology, United States

Hyunwoo Park, Student, Georgia Institute of Technology, United States

Mayank Gupta, Student, Georgia Institute of Technology, United States

Mark Braunstein, Professor, Georgia Institute of Technology, United States

Vikas Kumar, Student, Georgia Institute of Technology, United States

Duen Horng Chau, Assistant Professor, Georgia Institute of Technology, United States

Minsuk Kahng, Student, Georgia Institute of Technology, United States
Robert Pienta, Student, Georgia Institute of Technology, United States
Nicoleta Serban, Associate Professor, Georgia Institute of Technology, United States
Michael Thompson, Director of Business Intelligence, Children's Healthcare of Atlanta, United States

Healthcare processes are complex activities that span organizational, spatial, and temporal boundaries. Systemic insights are consequently difficult to achieve. Our research develops a data-driven methodology, fusing systems modeling, data mining, and visualization, to identify, describe, and visualize healthcare processes. We illustrate our methodology with a case study in pediatric healthcare.

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- 060-0410** Use of Traceability Technology in Healthcare Operations
Chun-Hung Cheng, Associate Professor, Chinese Univ of Hong Kong, Hong Kong
Ziye Zhou, Student, Chinese Univ of Hong Kong, Hong Kong

In this presentation, we will talk about an experiment in a Hong Kong hospital using traceability technology. With this system installed in two medical wards and people carrying RFID tags, we collected data on the interaction of people. The potential uses of these data will be discussed.

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- 060-1612** Meaningful Information Security
Juhee Kwon, Assistant Professor, City University of Hong Kong, Hong Kong
M Johnson, Professor, Vanderbilt University, United States

Certification mechanisms are often employed to signal performance of difficult-to-observe practices. In US healthcare, financial incentives linked to a certification (known as "meaningful-use" attestation) have been a key policy initiative to encourage EHR adoption. We examine how hospital attestation and past data breach performance influences the occurrence of subsequent breaches.

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- 060-0379** Can Two Rights Make a Wrong? Culture-technology Interactions in Healthcare
Carrie Queenan, Assistant Professor, University of South Carolina, United States
Thomas Kull, Assistant Professor, Arizona State University Tempe, United States
Sarv Devaraj, Professor, University of Notre Dame, United States

Experts recommend CPOE systems to improve the quality problems in hospitals. However, studies show mixed results. We hypothesize that CPOE effectiveness depends on patient safety culture, with CPOE complementing some aspects of patient safety culture and partially substituting for others. We empirically test this proposition using data from 268 hospitals.

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| 362 | Sunday, 04:30 PM - 06:00 PM, Fairchild West | <i>Track:</i> Healthcare Operations Management |
| | <i>Session:</i> Outpatient scheduling and staff planning | |
| | <i>Chair(s):</i> S.Abofazi (Mohamad) Soltani | |

- 060-0364** Increasing Nursing Staff Efficiency in a Cardiac Catheterization Laboratory
Saligrama Agnihotri, Professor, Binghamton University, United States
Anu Banerjee, Student, Binghamton University, United States

A hospital Cardiac Catheterization laboratory conducts procedures for inpatients, outpatients, and emergency patients. Currently, the staff productivity is very low but the amount of overtime paid to the staff is excessive. We present results of a study conducted to increase staff utilization, and reduce overtime cost and patient turnaround time.

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- 060-0409** Optimum Scheduling of Physicians in a Small Size Clinic
Umar Al-Turki, Professor, King Fahad University of Petroleum & Minerals, Saudi Arabia

This paper combines simulation and mathematical modeling for optimally scheduling physicians in small size clinic where resources are scarce and the need is high. Physicians preference timing, patients waiting times as well as facility utilization are considered in measuring the quality of scheduling. Alternative schedules are generated for additional objectives

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- 060-0443** Supply and Demand Alignment at Primary Care Facilities
Sina Faridimehr, Student, Wayne State University, United States
Azade Tabaie, Student, Wayne State University, United States
Seung Yup Lee, Student, Wayne State University, United States
Ratna Babu Chinnam, Professor, Wayne State University, United States
Alper Murat, Associate Professor, Wayne State University, United States
Evrin Dalkiran, Assistant Professor, Wayne State University, United States
Qingyu Yang, Assistant Professor, Wayne State University, United States

We propose statistical models to improve timely access for patients while maintaining clinic capacity utilization in primary care facilities. The models leverage correlations between scheduling practice, panel size management, appointment slot grid design and access performance. Results from testing the models at VA facilities are promising.

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- 060-1358** Appointment Scheduling and Walk-in Strategies with Unpunctual Patients
Sayedabolfazi (Mohamad) Soltani, Student, University of Alberta, Canada
Michele Samorani, Assistant Professor, University of Alberta, Canada

It is commonly believed that clinics that schedule appointments have lower patients' waiting time and providers' overtime than clinics that only allow walk-ins. However, if we consider patient unpunctuality, walk-in-only clinics may achieve a higher performance. In this research, we investigate the conditions under which each strategy is preferable.

363	Sunday, 04:30 PM - 06:00 PM, Gunston East	Track: Manufacturing Operations
	Session: Capacity Planning and Assessment	
	Chair(s): M Reza Abdi	

060-0523 Simulation Based Analysis of Job Shop Manufacturing Planning

Yogesh Gadinaik, Student, Mumbai University, India

Vijay Bilolikar, Associate Professor, Fr. C R College of Engineering, University of Mumbai India, India

The study attempts to model a complex and dynamic production system using discrete event simulation to conduct experiments for alternative manufacturing strategies in a cost effective way. The case study of a batch type manufacturing system illustrates adopted methodology to address the manufacturing aspects like delivery, inventory and resource management.

060-1092 Assessing Capacity Frontiers in Manufacturing Operations

Richard Hedman, Student, Dept of Technology Management and Economics, Division of Operations Management, Sweden

Peter Almström, Associate Professor, Dept of Technology Management and Economics, Division of Operations Management, Sweden

In this paper, we have developed definitions of capacity and a method to formulate capacity frontiers based on the design and execution of manufacturing processes. It is illustrated in a case, primarily presenting time data requirements together with implications on control and improvement of manufacturing operations.

060-0686 Capacity and Manufacturing System Configurations Considering Product Family Life Cycle Using Markov Analysis

M Reza Abdi, Assistant Professor, Bradford University, United Kingdom

The paper explores the necessity of a linkage between market demand and manufacturing capacity in a reconfigurable manufacturing system (RMS). A methodology is proposed to evaluate alternative configurations allocated to different products families in an uncertain market condition through a Markovian simulation model while considering end of product life cycle.

364	Sunday, 04:30 PM - 06:00 PM, Gunston West	Track: Marketing and OM Interface
	Session: Marketing and Information Technology	
	Chair(s): Monire Jalili	

060-1117 When Will Consumer Make the Buy Online?

Wanxi Li, Assistant Professor, Radford University, United States

Yiyuan Liu, Assistant Professor, Otterbein University, United States

In this study, we investigate the major factors that influence the time online consumers take to make the purchase decision. We propose an empirical model to study the length of the time the consumers take based on their online behavior, and discuss the managerial implications for operations of E-tailer.

060-1398 Optimal Rental-based Price Discounts for Digital Content

Monire Jalili, Student, University of Oregon, United States

Michael Pangburn, Associate Professor, University of Oregon, United States

The rent-to-own concept is particularly well suited for digital content, given that there is no return flow of used (i.e., rented) products for a firm to manage. Given consumer utility uncertainty, we analyze the ability of post-rental price purchase discounts to improve the (monopolist) firm's aggregate profits with heterogeneous consumers.

060-1351 Understanding the Drivers of the Daily App Rank: The Role of Revenue Models

Daniele Ragaglia, Student, Università Degli Studi Di Palermo, Italy

Paolo Roma, Assistant Professor, Università Degli Studi Di Palermo, Italy

In this paper, based on data from two major app stores (Apple Store and Google Play), we study the role of several revenue models adopted by developers in the success of an app measured in terms of daily rank.

060-1037 The Impact of Payment Scheme on Seller's Performance in E-commerce

Na Xu, Student, Harbin University of Science and Technology, China

Bai Zhen, Professor, Harbin University of Commerce, China

Pay-to-order and pay-on-delivery are two main kinds of e-commerce payment option in China now. We examine the impact of payment scheme on consumers' behavior and seller's operational decisions in e-commerce. We characterize the rational expected equilibrium of online seller to help them improve performance and payment service.

365	Sunday, 04:30 PM - 06:00 PM, Coats	Track: Economics Models of Operations
	Session: Retail Operations & Supply Chain Management	
	Chair(s): Hans S Heese	

060-0285 Selecting Delivery Patterns for Grocery Chains

Andreas Holzapfel, Lecturer, Catholic University Eichstaett-Ingolstadt, Germany

Alexander Hübner, Assistant Professor, Catholic University Eichstaett-Ingolstadt, Germany

Heinrich Kuhn, Professor, Catholic University Eichstaett-Ingolstadt, Germany

Michael Sternbeck, Lecturer, Catholic University Eichstaett-Ingolstadt, Germany

We develop a planning concept for defining repetitive delivery patterns according to which stores of a grocery retailer are supplied. The model minimizes costs in warehousing, transportation and instore operations. A solution approach is developed for clustering stores and selecting delivery patterns. The approach is applied to a European retailer.

060-0391 Probabilistic Selling for Vertically Differentiated Products

Xiajun Pan, Assistant Professor, University of Florida, United States

Quan Zheng, Student, University of Florida, United States

Probabilistic selling has been extensively studied for horizontal differentiated products. We examine the impact of probabilistic selling on vertically differentiated products and characterize conditions under which the probabilistic selling strategy provides a higher profit. We show that consumer valuation distribution, the capacity of products, and competition play important roles.

060-0424 Campaign Earlier or Later? Sponsored Search Advertising when Customers Re-click

Shanshan Hu, Assistant Professor, Indiana University Bloomington, United States

Goker Aydin, Associate Professor, Indiana University, United States

Shengqi Ye, Assistant Professor, University of Texas Dallas, United States

Customers might click a retailer's link and check its product multiple times before making purchasing decisions. Noting this behavior, we investigate the retailer's optimal advertising policy when selling seasonal products over a predetermined horizon. We show that the retailer may want to advertise aggressively early in the selling season.

060-0483 Optimal Cost Reduction under Outsourcing and Competition

Eda Kemahlioglu-Ziya, Assistant Professor, North Carolina State University, United States

Olga Perdikaki, Assistant Professor, Texas A&M University College Station, United States

We consider a supply chain with two competing OEMs. One is a vertically integrated company. The other can insource, outsource to a third party or outsource to its vertically integrated competitor. We study the firms' optimal cost reduction efforts under these three different settings.

366	Sunday, 04:30 PM - 06:00 PM, Monroe	<i>Track:</i> Product Innovation and Technology Management
	<i>Session:</i> Industry Studies on Product Innovation and Technology Management	
	<i>Chair(s):</i> Anant Mishra	

060-1299 Agile Management and Software Development Process & Impacts on Federal Software Capability Evolution

James Murray, Student, George Mason University, United States

This presentation provides a historical perspective and rationale for the evolution of agile methods. The presentation puts in context past impacts in industry on both software and management practices. Current challenges and approaches for leveraging these new methods are described. The pros and cons of practice application are identified.

060-1687 Cost-reducing Innovation and the Role of Patent Intermediaries

Anupam Agrawal, Assistant Professor, University of Illinois Urbana-Champaign, United States

Shantanu Bhattacharya, Associate Professor, Singapore Management University, Singapore

Sameer Hasija, Assistant Professor, INSEAD, Singapore

Patent intermediaries buy innovations from external providers and license them to practicing firms. In this paper, we analyze the competition between incumbent firms and a patent intermediary for external innovations. We show that the outcome of the acquisition and licensing game critically depends on the degree of the cost-reducing innovation.

367	Sunday, 04:30 PM - 06:00 PM, Holmead East	<i>Track:</i> Service Operations
	<i>Session:</i> Innovative Models in Service Operations	
	<i>Chair(s):</i> Sami Najafi	

060-0665 When You Work with a Super Man, Will You Learn to Fly? An Empirical Study of the Impact of Coworkers on Workers

Tom Tan, Assistant Professor, Southern Methodist University, United States

Serguei Netessine, Professor, INSEAD, Singapore

We use detailed operational data from a casual restaurant chain to understand how peer effects affect servers' performance measured in meal duration and sales. We find inverted-U-shaped relationships between peer effects and performance. Our results highlight a need for more nuanced approaches to leveraging peer effects in optimal scheduling decisions.

060-1206 Is Over-promising of Product Features Desirable When Consumers Are Loss-averse?

Sami Najafi, Assistant Professor, Santa Clara University, United States

Nishant Mishra, Assistant Professor, Rotterdam School of Management, Netherlands

Andy Tsay, Associate Professor, Santa Clara University, United States

We consider a firm selling two versions of a product/service to loss-averse consumers at two different times. We find that when consumers are over-promised about the first version's features, counter-intuitively, they are willing more to buy the second version, thus increasing the firm's profitability.

- 060-1214** Third Party Ownership and the Adoption of Solar Energy Systems in the U.S. Residential Market
Jose Guajardo, Assistant Professor, University of California Berkeley, United States
Ernesto Guerra, Student, University of California Berkeley, United States

We analyze the role of business models in the adoption of solar PV systems in the U.S. residential market. We formulate an empirical model to characterize the drivers and effects of Third Party Ownership in the adoption of solar systems, in the context of government incentives and supply-side determinants.

- 060-1368** The Impact of Competition for Common Customer Base on Agent's Compensation Plan
Elnaz Jalilipour Alishah, Student, University of Washington, United States
Yong-Pin Zhou, Associate Professor, University of Washington, United States
Hamed Mamani, Assistant Professor, University of Washington, United States

We study effect of agent's competition for common customer base on incentive efficiency of compensation packages. We model an environment where customers make the final decision based on perceived service quality, while incurring disutility from waiting. We suggest contracts and operational tools to coordinate and analyze their practical implementation.

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| 368 | Sunday, 04:30 PM - 06:00 PM, Holmead West | <i>Track:</i> Supply Chain Management |
| | <i>Session:</i> Practical Issues in Supply Chains III | |
| | <i>Chair(s):</i> Cristina Sancha | |

- 060-0496** Supply Chain Integration in Emerging Markets
Cristina Sancha, Student, Esade Business School, Spain
Christina Wong, Associate Professor, Hong Kong Polytechnic Univ, Hong Kong
Cristina Gimenez, Associate Professor, Esade Business School, Spain

In emerging countries, supply chain integration may pose more challenges than in developed countries (e.g., poor logistic infrastructure). The objective of this paper is to study how firms in emerging markets (i.e., China, India, Brazil, Romania and Hungary) are managing their supply chains in terms of internal and external integration.

- 060-0735** On-line Degree Completion Program in Supply Chain Management
Larry Taube, Associate Professor, University of North Carolina Greensboro, United States
Vidyaranya Gargeya, Professor, University of North Carolina Greensboro, United States

The University of North Carolina at Greensboro has had a long history of delivering the Supply Chain and/or Operations Management undergraduate curriculum. In the early 2000s, student demand dried up. The paper describes the development of an online program, enhancing enrollment from 4 students to 54 students in two years.

- 060-1026** The Supply Chain - and Engine for Growth
Ann Vereecke, Professor, Vlerick Business School, Belgium
Tom van Steendam, Student, Vlerick Business School, Belgium
Alex Waterinckx, Senior Manager, PWC, Belgium

For the supply chain to be an engine for profitable and sustainable growth, it needs a robust design and a strong set of capabilities. Based on case research in European companies, we identify the 6 C's of supply chain management; six practices supporting growth.

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| 369 | Sunday, 04:30 PM - 06:00 PM, Kalorama | <i>Track:</i> Supply Chain Management |
| | <i>Session:</i> Inventory Management in Supply Chains | |
| | <i>Chair(s):</i> Yimin Wang | |

- 060-0604** The Safety Stock and Inventory Cost Paradox in a Stochastic Lead-time Setting
Stephen Disney, Professor, Cardiff University, United Kingdom
Arnold Maltz, Associate Professor, Arizona State University Tempe, United States
Xun Wang, Lecturer, Cardiff University, United Kingdom
Roger Warburton, Professor, Boston University, United States

We study a stochastic lead-time problem motivated by real world global shipping data. Replenishment quantities are generated by the Order-Up-To policy which aims to achieve a strategic availability target. We show that, unlike the constant lead-time case, minimum safety stocks do not always lead to minimum costs under stochastic lead-times.

- 060-1098** High-resolution Analysis for Last-mile Delivery Using GPS Data
Daniel Merchan, Student, Massachusetts Institute of Technology, United States
Edgar Blanco, Professor, Massachusetts Institute of Technology, United States

This paper explores potential applications of GPS technology to analyze urban freight operations. In particular, we explore the sensitivity of stop detection algorithms and their impact on route characterization metrics. We also review applications for robust network planning and probabilistic models for real-time logistics decision making.

- 060-1080** Transshipment Networks for Multi-level Distribution in Congested Urban Areas
Daniel Merchan, Student, Massachusetts Institute of Technology, United States
Edgar Blanco, Professor, Massachusetts Institute of Technology, United States

We introduce the concept of urban transshipment networks (UTNs), a collection of strategically located transshipment spaces, for efficient and flexible last mile delivery operations in congested urban areas. We then propose a multi-tier capacitated location-routing model to address this problem and explore its applicability through a real case study.

- 060-1040** Spare Parts Inventory Control under Markov-modulated Supply Risk
Mustafa Hekimoglu, Student, Erasmus University Rotterdam, Netherlands
Erwin van der Laan, Associate Professor, Erasmus University Rotterdam, Netherlands
Rommert Dekker, Professor, Erasmus University Rotterdam, Netherlands

Spare parts supply chains are subject to nonstationary supply risk. In this study, we consider Markov modulated random lead time and supply failure risk to model supply risk for spare parts. Our results indicate that combined effect of these two risk factors may rise up-to 51% of the total cost.

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| 371 | Sunday, 04:30 PM - 06:00 PM, Morgan | <i>Track:</i> Supply Chain Management |
| | <i>Session:</i> Supply Chain Coordination 4 | |
| | <i>Chair(s):</i> Ricardo Martins | |

- 060-0707** Supply Chain Coordination Based on the Trade Credit and Option Contract under Capital Constraint
Zhaowei Hao, Student, Peking University, China
Lihua Chen, Professor, Peking University, China

we study a supply chain including one supplier and one capital constrained retailer. we discuss the optimal option ordering policy for the retailer, optimal option production policy for the supplier, the conditions for the supply chain coordination and how their policy were affected by default risk and initial capital.

- 060-0738** The Foundations of Relationships Buyer-suppliers in Supply Networks at Free Economic Zones
Armando Souza Júnior, Lecturer, Federal University of Amazonas (UFAM), Brazil
Ricardo Martins, Professor, Federal University of Minas Gerais (UFMG), Brazil

The main purpose of this article was to broaden the debate about the factors conditioning both the structure and the content of ties in supply chain relations by including geo-economic variables. So, we analyzed the relationships between focal companies and local suppliers at the Manaus (Brazil) Free Economic Zone.

- 060-1185** The Role of Employee Integration in Supply Chain Integration
Yoon Hee Kim, Assistant Professor, Georgia Southern University, United States
Tobias Schoenherr, Assistant Professor, Michigan State University, United States

Supply chain integration (SCI) has received increasing attention. SCI is a complex phenomenon that transcends organizational and functional boundaries as well as hierarchical layers. Yet, studies have focused on SCI across exchange partners and internal functions while ignoring employee integration. This study investigates the role of employee integration in SCI.

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| 372 | Sunday, 04:30 PM - 06:00 PM, Northwest | <i>Track:</i> Revenue Management and Pricing |
| | <i>Session:</i> Revenue Management for Retailing | |
| | <i>Chair(s):</i> Dana Popescu | |

- 060-0030** Advance Selling Strategies for Oligopolists When Considering Product Diffusion
Xuemei Li, Student, University of Science and Technology of China, China
Xiaoying Cheng, Student, University of Science & Technology, China
Yanhong Sun, Associate Professor, University of Science and Technology of China, China

We consider pricing competition of advance selling between two firms. We analyze the pricing strategy of the sellers under two scenarios with (without) consideration of the product diffusion, and conduct numerical analysis to investigate the effect of brand disloyalty on the two firms' pricing strategies and profit under two scenarios.

- 060-1222** Newsvendor Selling to Loss Averse Consumers with Stochastic Reference Points
Sami Najafi, Assistant Professor, Santa Clara University, United States
Ming Hu, Assistant Professor, University of Toronto, Canada
Qian Qu, Assistant Professor, Shanghai University of Finance and Economics, China
Opher Baron, Associate Professor, University of Toronto, Canada

We study a newsvendor who repeatedly sells a single perishable product to two types of consumers: regular consumers and bargain hunters. The regular consumers are loss averse with random reference levels that is their probabilistic beliefs. We show the impact of loss aversion on the newsvendor's inventory and pricing decisions.

- 060-1465** Attribute-based Demand Forecasting for Retail Products
Bryan Ball, Student, New York University, United States
Andrew Vakhutinsky, Principal Scientist, Revionics, United States

We present an analysis of several methods of "sight unseen" demand forecasting for retail goods using various attribute-based models including regression and machine learning. We describe the product attributes and methods of holdout testing to gauge prediction accuracy and compare models based on actual demand data for various retail categories.

- 060-0917** Repricing Algorithms in E-commerce

Sunday, 04:30 PM - 06:00 PM

Dana Popescu, Assistant Professor, INSEAD, Singapore

We analyze a typical online platform with multiple sellers selling an identical product and using automated repricing algorithms to set prices. The sellers differ in terms of some quality dimension (e.g., rating score or number of reviews). We compare the performance of these algorithms with the Nash equilibrium profits.

Sessions for Monday, May 11

Monday, 08:00 AM - 09:30 AM

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Monday, 08:00 AM - 09:30 AM, Columbia 1

Track: Behavior in Operations Management

Session: Big Data, Saftey and Military

Chair(s): Kenneth Schultz

060-1522 Operations and Safety: Necessary tradeoff?

Matthew Douglas, Assistant Professor, Air Force Institute of Technology, United States

In the face of operational demands, employees sometimes discount safety considerations in the performance of their duties. In high risk occupations, such as aircraft maintenance, this practice can have severe implications. Leaders may be able to eliminate the operations-safety tradeoff by identifying mechanisms to simultaneously achieve effectiveness in both areas.

060-0403 Locking Suspect in 3 Seconds by Police Big Data Application

Sien Chen, ceo, Xiamen University, China

Zhenyu Liu, Professor, Xiamen University, China

Police agencies should go with the tide of development to start with such aspects as work thinking, top design, public information sharing and application and talent provision so as to promote the new development and progress of police work.

060-1005 Cognition vs Computational Power in High-volume Store Replenishment Decisions

Shivom Aggarwal, Student, IE Universidad, Spain

Antti Tenhiala, Assistant Professor, IE Universidad, Spain

There is paucity of research on managerial cognition vs computation power of systems, in operational decision making due to intractability of human decisions. Using multi-store panel data from European retailer, we study the antecedents of human deviant behavior from fact-based proposals and under what conditions such behavior be allowed.

060-1699 Motivation and Culture for Fuel Efficiency in the USAF

Kenneth Schultz, Professor, Air Force Institute of Technology, United States

We establish fuel efficiency metrics and goals for C-17 pilots in the USAF. We examine different feedback conditions. We map social, command and instruction networks and look for patterns in adoption of fuel efficient practices.

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Monday, 08:00 AM - 09:30 AM, Columbia 2

Track: Closed Loop Supply Chains

Session: Lifecycle Management and Considerations in End-of-Life (EOL) Recovery

Chair(s): Surendra Gupta

060-0636 End-of-Life Product Warranty

Ammar Alqahtani, Lecturer, King Abdulaziz University, Saudi Arabia

Surendra Gupta, Professor, Northeastern University, United States

This study presents an approach to determine how to predict warranty period for disassembled components using sensor information about the age and usage of each and every EOL product on hand to meet product, component and recycled material demands while minimizing the cost associated with warranty and maximizing manufacturer's profit.

060-0640 Optimizing Selection of Components from End-of-Life Products

Aditi Joshi, Student, Northeastern University, United States

Surendra Gupta, Professor, Northeastern University, United States

This paper presents an approach for selection of components from sensor embedded End-of-Life (EOL) products with multiple designs. The main purpose of this study is to determine the best strategy to retrieve components from appropriate products for optimum retrieval profit, quality, material sales revenue and disposal weight.

060-0797 Applications of Connectors in Optimizing the Disassembly Process for End-of-Life Products

Aditya Pandit, Student, Northeastern University, United States

Surendra Gupta, Professor, Northeastern University, United States

This presents an approach for selecting connectors for products with the purpose of optimizing their disassembly at End-of-life. The purpose of this study is to determine which connector would best fit the nature of a product in order to be cost effective, maintain quality and increase the ease of disassembly.

060-1161 Life-cycle Decision Making for Electronic Products

Thomas Nowak, Student, Institute for Transport and Logistics Management, Austria

Gernot Lechner, Senior Lecturer, Institute of Production and Operations Management banner pom, Austria

This work analyzes optimal pricing and production strategies of an original equipment manufacturer in a closed-loop supply chain. First, pricing and production decisions are investigated using a two-period newsvendor model with product returns. Second, these findings are compared with the results of an empirical study on new and refurbished laptops.

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Monday, 08:00 AM - 09:30 AM, Columbia 3
Session: Manufacturing Empirical Research
Chair(s): Giuliano Almeida Marodin

Track: Empirical Research in Operations Management

060-0347 Manufacturing Strategies in Different Environments: Does Equifinality or a Dominant Strategy Exist?

Shaohan Cai, Associate Professor, Carleton University, Canada
Zhilin Yang, Professor, City University of Hong Kong, Hong Kong

This study addresses two essential issues related to equifinality with data collected from 434 Chinese firms: (1) whether firms can choose different but equally effective manufacturing strategies for different environments (equifinality) and (2) whether there is one strategy adopted by more firms than others (dominant strategy) in each individual environment.

060-1560 The Concept of an Industrial Additive Manufacturing System

Daniel Evers, Lecturer, Cardiff University, United Kingdom

Whilst there is much research enthusiasm for the potential of Additive Manufacturing machines, few studies have considered potential benefits arising from the manufacturing system as a whole. This paper examines the concept of an Additive Manufacturing System, and through case research demonstrates the contribution of each component towards competitive manufacturing.

060-0611 Beliefs and Assumptions Embedded in Lean: A Multi-method Study

Giuliano Almeida Marodin, Reader, Fisher College of Business, United States
Johnny Rungtusanatham, Professor, Ohio State University, United States
Peter Ward, Professor, Ohio State University, United States
Steffanie Wilk, Associate Professor, Fisher College of Business, United States

What beliefs and assumptions are embedded in lean? We answer this question in a two-method study. We first conducted a Delphi panel study to elicit and categorize beliefs and assumptions embedded in a lean. We then administered a large-sample survey to validate the Delphi panel study results.

381

Monday, 08:00 AM - 09:30 AM, Columbia 4
Session: Inventory and Shelf Space Management
Chair(s): Alexander Hübner

Track: Retail Operations Management

060-0830 A Shelf Space Model for Stochastic and Space Elastic Demand

Alexander Hübner, Assistant Professor, Catholic University Eichstaett-Ingolstadt, Germany
Heinrich Kuhn, Professor, Catholic University Eichstaett-Ingolstadt, Germany
Kai Schaal, Lecturer, Catholic University Eichstaett-Ingolstadt, Germany

Retail shelf space planning means offering right assortment with right quantity. We develop a model with limited shelf space, space elasticity effects and stochastic customer demand. A time-efficient algorithm achieves near-optimal results even for practically relevant large-scale. We apply it for a case study with a major European grocery retailer.

060-0656 An Analytics Framework for the Retail Shelf Space Problem

Ramakrishna Govindu, Lecturer, University of South Florida, United States
Anurag Agarwal, Professor, University of South Florida, United States
James Curran, Associate Professor, University of South Florida, United States

Retailers these days are collecting a lot of data and trying to optimize limited shelf space. In this paper, we propose decision support system using a framework involving both predictive and prescriptive analytics for optimizing the retail shelf space problem.

060-0263 Efficient Algorithm Assortment Planning with Limited Shelf Space

Chun-Miin Chen, Assistant Professor, Bucknell University, United States
Zhaolin Li, Senior Lecturer, The University of Sydney, Australia

We study the impact of limited shelf space on assortment planning in a single-period model. As the shelf-space constraint makes the optimization problem NP-complete, we investigate a comprehensive measure which enables efficient identification of the variants to be added into the assortment and efficient allocation of the available shelf space.

383

Monday, 08:00 AM - 09:30 AM, Columbia 10
Session: Solid Waste Management
Chair(s): João Amato-Neto

Track: Sustainable Operations

060-1498 Risk Management in Electronics Recycling of Waste: A Model for Decision Making

João Amato-Neto, Professor, Universidade De Sao Paulo, Brazil
Germano Correia, Professor, University of São Paulo, Brazil

Electronic devices disposal is rapidly growing due to the frequent introducing of innovative products that rapidly incorporate new technological advances. This has made the replaced products disposable and obsolete. Thus, the accumulation of electronic scrap has promoted urgent questions as to their disposal and the effects on the environment and society. The configuration of these actors reverse chains is defined in terms of the risks (opportunities) identified, processes available (investments), the consequences of risk response (economic return). This research project aims to develop a model that enables each organization component of reverse chains recycling of electronic waste, properly define its role and its operation to be successful in the economic purpose as the social and environmental objectives.

060-1516 Environmental Advantages Measured by Wuppertal Method on Disposal Waste from the Industry

Rosangela Vanalle, Professor, Universidade Nove De Julho, Brazil

Carlos Franzini Filho, Student, Universidade Nove De Julho, Brazil

In reason of growing concerns from the society about sustainability, the aim of this paper is to present alternatives for solid waste disposal generated by industry and show some environmental advantages according calculation method Wuppertal. This single case study from industry shows alternatives to deal with underutilized resources.

060-0603 The Disposal of Electronic Waste: Green IT with Perspective in Reverse Logistics

Davis Alves, Student, UNIP, Brazil

Milton Farina, Professor, USCS, Brazil

Antonio Silva, Student, Universidade De Sao Paulo, Brazil

Mark Tunu, Student, USCS, Brazil

Despite of the dramatic increase in electronic disposals, a major current focus is how to ensure recycling and the logistics reverse of them in order to minimizing their environmental impact. This research investigated how the first Brazilian Centre for Disposal of Information Technology Waste deals with the Green IT

060-1011 Solid Waste Textiles: Case Study of a Brazilian company

Rita Moro, Student, University of São Paulo, Brazil

Francisca Mendes, Professor, Universidade De Sao Paulo, Brazil

Ana Amancio, Student, University of São Paulo, Brazil

The textile chain involves a huge and varied network of raw material industry: fiber, passing by spinning processes, weaving, dyeing and manufacturing, producing highly diversified and differentiated products. As a result generating tons of solid waste throughout its production process. Reuse and recycling needs to be optimized.

384 Monday, 08:00 AM - 09:30 AM, Columbia 11*Track: Sustainable Operations**Session: Challenges in Operational Decision Making**Chair(s): Rommert Dekker*

060-0187 Multi-criteria Disposition Decision Framework for Time Sensitive Products Recovery System

Jitendra Madaan, Assistant Professor, Indian Institute of Technology Delhi, India

Parikshit Charan, Assistant Professor, Indian Institute of Management Raipur, India

Proposed ITL-TOPSIS decision analysis address issue of disposition decision making under uncertainty & incomplete information in a more precise manner. This paper capture the affect of time sensitive products on disposition decision by comparing the ranking of optimal EOL options for short life cycle and long life cycle returned products.

060-0365 Economic and Environmental Comparison of Different Order Scheduling Strategies

Dincer Konur, Assistant Professor, Missouri University of Science And Technology, United States

James Campbell, Professor, University of Missouri St Louis, United States

Sepideh Monfared, Student, Missouri University of Science And Technology, United States

This study analyzes an integrated stochastic inventory control and supplier selection problem under environmental regulations. We analyze and compare the optimal supplier selection and order splitting decisions with single sourcing and two delivery schedules for multi-sourcing, namely, sequential ordering and sequential delivery, in terms of both economic and environmental performance.

060-1312 Design and Planning for Green Global Supply Chains under Periodic Review Replenishment Policies

Rommert Dekker, Professor, Erasmus University Rotterdam, Netherlands

John Mallidis, Lecturer, Aristotle University of Thessaloniki, Greece

Dimitrios Vlachos, Associate Professor, Aristotle University of Thessaloniki, Greece

Eleftherios Iakovou, Professor, Aristotle University of Thessaloniki, Greece

We quantify the impact of jointly optimizing strategic network design and tactical inventory planning on the cost and CO2 emissions of multi-echelon logistics networks. The model is applied in a case study in Greece. Present CO2 costs are too low to have an impact on supply chain choices.

386 Monday, 08:00 AM - 09:30 AM, Piscataway*Track: Inventory Management**Session: Inventory Policies and Algorithms**Chair(s): S. Viswanathan*

060-1487 Critical Level Rationing Policy for Continuous Review Inventory Systems with Multiple Demand Classes

Sugoutam Ghosh, Lecturer, Nanyang Business School, Singapore

Rajesh Piplani, Associate Professor, Nanyang Technological University, Singapore
S. Viswanathan, Professor, Nanyang Business School, Singapore

We extend the critical level rationing policy for continuous review inventory systems with more than 2 demand classes. The expression for expected cost is developed succinctly as a recursive function involving nested binomials. Numerical studies show that partitioning demand into more than 2 classes can result in significant cost savings.

- 060-0147** Joint Replenish Problem with Dissimilar Items and Continuous Review
Charles Schmidt, Professor, University of Alabama Tuscaloosa, United States
Linda Li, Student, University of Alabama Tuscaloosa, United States

We develop a new policy and also a corresponding algorithm to solve a JRP with dissimilar SKUs and continuous review. Especially, we find an efficient way to solve the linear equation system for each iteration of the algorithm.

- 060-0305** Optimal Operational Policy for Industrial Ecosystem
Wei Yang, Associate Professor, Long Island University at Post, United States
Youyi Feng, Professor, Zaragoza Logistics Center, Spain

We use a generalized serial inventory system to model an industrial ecosystem that has exogenous demand at every stage. Each stage produces one core product to fulfill its external random demand and one byproduct used as feedstock to its immediate downstream stage for its own production. Optimal policies are derived.

- 060-0998** A Synchronized Supply Chain for Reducing Decoupling Stock
Jian Wang, Associate Professor, Shanghai University, China
Hiroaki Matsukawa, Professor, Keio University, Japan
Shane Schvaneveldt, Professor, Weber State University, United States

Decoupling stock is required when inventory decision-making is carried out independently in different units in a supply chain. In this research we formulate the function for calculating decoupling stock, and analyze the key factors for reducing decoupling stock through synchronization.

- 060-1045** A New Algorithm to Optimize a Can-order Inventory Policy for Two Companies in a Horizontal Partnership
Stefan Creemers, Associate Professor, IESEG School of Management, France
Silvia Padilla Tinoco, Student, Katholieke Universiteit Leuven, Belgium
Robert Boute, Associate Professor, Vlerick Management School, Belgium

We study a setting where two companies coordinate their replenishments using a can-order policy. We develop an efficient algorithm that allows to evaluate the total joint costs as well as the individual transportation and inventory holding costs of each company. Using the model, we obtain the optimal can-order policy.

387	Monday, 08:00 AM - 09:30 AM, Cardozo	Track: Information in Operations Management
	Session: Role of Information in Manufacturing	
	Chair(s): Patricia Deflorin	

- 060-0708** Manufacturing Execution in Smart Factories
Elmar Hartweg, Professor, Lemgo, Germany

The Smart Factory is the core element of the German Government's High-Tech strategy, the Industry 4.0. Manufacturing Execution Systems are it's backbone. This article describes the interfaces to ERP Systems and process automation modules as realized within a Smart Factory as well as a model for an economic efficiency calculation.

- 060-1622** Knowledge Transfer in Manufacturing Networks
Patricia Deflorin, Professor, University of Applied Sciences HTW Chur, Switzerland
Maike Scherrer-Rathje, Senior Lecturer, University of St. Gallen, Switzerland
Levente Szasz, Associate Professor, Universitatea Babes-Bolyai, Romania

In order to be able to benefit from the shared knowledge, each plant needs to be able to absorb it. Hence, we need to get an understanding of the composition of absorptive capacities within manufacturing networks to be able to derive prerequisites as of when knowledge can be absorbed effectively.

388	Monday, 08:00 AM - 09:30 AM, Du Pont	Track: Humanitarian and Not-for-profit Operations
	Session: Humanitarian Logistics for Disaster Preparedness	
	Chair(s): Begona Vitoriano Pamela Nolz	

- 060-0546** Humanitarian Logistics at the Colombian Red Cross
Camilo Solano, Student, Industrial Engineering Department, Colombia
Alfonso Pedraza-Martinez, Assistant Professor, Indiana University, United States
Fidel Torres, Assistant Professor, Industrial Engineering Department, Colombia

In collaboration with the Colombian Red Cross (CRC) we develop a mathematical model for the allocation and distribution of humanitarian aid that includes: bi-objective minimization of total cost and delivery time, Multi-product, and Heterogeneous ground fleet. We use real data for parameter estimation and offer managerial insights to CRC.

- 060-0763** A Multi-criteria Optimization Model for a Humanitarian Logistics Problem: An Integral Approach

Christopher Mejía-Argueta, Academic Leader, Logyca, Colombia
Juan Gaytan Iniestra, Emeritus Professor, UAEM, Mexico
Rafael Caballero, Professor, Universidad de Málaga, Spain
Julián Molina, Associate Professor, Universidad de Málaga, Spain
Begona Vitoriano, Associate Professor, Universidad Complutense De Madrid, Spain

An integral optimization model for the preparedness phase regarding evacuation, distribution, location of facilities and preposition stock management policy is presented. Equity (minimizing the maximum evacuation and distribution flow-times) and total cost are considered as criteria. The usefulness of the model is validated in a Mexican flood and other scenarios.

060-1004 A Bi-criteria Facility Location Problem for Emergency Medical Service Stations Considering Patient Groups

Christian Burkart, Student, Vienna Univ of Econ & Business Admin, Austria
Tina Wakolbinger, Professor, Vienna Univ of Econ & Business Admin, Austria

Optimal locations for emergency medical service facilities are chosen considering cost and coverage (unserved emergencies within a time limit) aspects. Time critical and non- time critical patient groups are considered. An adapted Maximal Covering Location Problem is developed to determine Pareto-optimal solutions and highlights trade-offs between the two criteria.

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Monday, 08:00 AM - 09:30 AM, Fairchild West

Track: Healthcare Operations Management

Session: Tele-medicine and home health

Chair(s): Xiaojin Liu

060-0463 Time is of the Essence: Simulation-based Optimization of Telemedicine and Stroke Team Deployment

Elham Torabi, Student, Lindner College of Business, United States
Craig Froehle, Professor, University of Cincinnati, United States
Opeolu Adeoye, Associate Professor, College of Medicine, United States

Responsiveness is imperative in healthcare delivery, especially in stroke treatment. Telemedicine can reduce the problem of colocation for time- and cost-sensitive medical care, but is itself costly, inhibiting adoption. Using GIS-based simulation-optimization, we design an optimal policy for deploying telestroke technology across 17 hospitals within a metropolitan region.

060-0881 Business Process Optimization under Remote Medical Treatment

Ke Wang, Student, Southeast University, China
Lindu Zhao, Professor, Southeast University, China
Weili Xue, Associate Professor, Southeast University, China

This paper gives a prospect of the remote medical treatment (RMT) development in China, and proposes optimization models to evaluate the hospital's inbound process when the RMT is introduced, and to optimize the outbound logistics when the healthcare system switches from the single hospital mode to the "hospital+ pharmacy" mode.

060-0915 Low-carbon and Safety Home Health Care Logistics Operation Optimization

Ke Wang, , Southeast University, China
Lindu Zhao, Professor, Southeast University, China
Mengya Yu, Student, Southeast University, China

A solution procedure is presented for logistics optimization problem in home health care, with objectives to achieve low-carbon and safety through reducing travel time by alternative mode of transport, and increase the direct care time and visit frequency. A programming model is developed to formulate the problem, proven feasible by results.

060-1133 Business Model Innovation for Tele-health Service – From the Perspective of Operations Management

Jiun-Yu Yu, Assistant Professor, National Taiwan University, Taiwan, Republic of China

Tele-Health is regarded a promising solution for future healthcare, but previous attempts to design-and-deliver such services rarely produced lasting favorable results. Anker (2011) maintained that tele-health systems should be classified into four generations. This study reexamines this idea from OM's perspective and extends it to innovate the tele-health business model.

060-1390 Towards Effective Use of EHR systems: Causes and Consequences of Telemedicine Adoption in Clinical Care

Xiaojin Liu, Student, University of Minnesota, United States
Susan Goldstein, Associate Professor, University of Minnesota, United States
Kingshuk Sinha, Professor, University of Minnesota, United States

The development of telemedicine capability is a critical goal for health care providers. However, little is known about the role of workforce capability and location variations in the implementation process. We investigate their effect on development of telemedicine capability for meaningful use, controlling for other organizational characteristics.

392

Monday, 08:00 AM - 09:30 AM, Gunston East

Track: Product Innovation and Technology Management

Session: Innovation in Startups and Entrepreneurial Settings

Chair(s): Paul Swamidass

060-1492 Technology Entrepreneurship Ecosystem in India: Findings from a Survey

Karuna Jain, Professor, National Institute of Industrial Engineering, Mumbai, India
Ruchita Gupta, Assistant Professor, National Institute of Industrial Engineering, India
Anand Kusre, Professor, IIT Bombay, India
Kirankumar Momaya, Professor, IIT Bombay, India

Technology development and entrepreneurial spirit fuels growth of the nation. Indian Government has taken initiatives to create Technology Entrepreneurship (TE) ecosystem. The survey based research was conducted to study evolution of techno-entrepreneurial firms in India. In this paper, we present TE ecosystem evolved recently in India and enabling factors.

060-0879 Why Technology-based Startups Fail? An IT Management Approach

Fabio Silva, Student, CEETEPS, Brazil
Romulo Fabricio Junior, Student, CEETEPS, Brazil
Rodrigo Silva, Student, CEETEPS, Brazil

The technology-based startups are highly innovative initiatives but are also known to be inserted in uncertain and risky scenarios. Proof of this are the high "mortality rates" of these initiatives. This study seeks to identify its main causes focusing on IT management.

060-1154 Strengthening of Open Innovation Model: Using Startups and Technology Parks

Romulo Fabricio Junior, Student, CEETEPS, Brazil
Fabio Silva, Student, CEETEPS, Brazil
Eliane Simoes, Professor, CEETEPS, Brazil
Napoleao Galegale, Professor, CEETEPS, Brazil
Getulio Akabane, Retired, CEETEPS, Brazil

The R&D center of a Chinese multinational in Brazil has been making open innovation based on partnerships with other companies, universities, and research institutes in Brazil. This paper studies how this open innovation strategy can benefit from a partnership with startups to create a ecosystem for generating disruptive innovation.

060-0125 Innovating Engineers: Value Creators for New Startup Businesses

Paul Swamidass, Professor, Auburn University, United States

Engineers are not taught they are value creators for new startup business. A seven-phased model of technological innovation explains the value-creating role of engineers in the early phases of technological innovation. This paper is based on an "Engineer-Entrepreneur" course offered to engineers using a new book.

393	Monday, 08:00 AM - 09:30 AM, Gunston West	<i>Track:</i> Marketing and OM Interface
	<i>Session:</i> Operations and Channel Structure	
	<i>Chair(s):</i> Saibal Ray Fei Qin	

060-0153 Online User Reviews and Trust: A Cross Cultural Study

Mei Li, Assistant Professor, University of Notre Dame, United States
Beibei Dong, Assistant Professor, Lehigh University, United States

We conducted behavioral experiments to empirically investigate how different aspects of online reviews (e.g., source, valence and content of the reviews) influence consumers' trust of reviews. We then compare these effects in two different cultural contexts: US and China.

060-0564 The Benefit of Channel Decentralization under Sequential Quality Choice

Victor Shi, Associate Professor, Wilfrid Laurier University, Canada

This paper considers a duopoly competition where two firms determine their vertical qualities sequentially and their costs of quality development may be different. Both firms can centralize or decentralize their sales channels. We find that if quality choices are endogenous, the follower can benefit from decentralization.

060-1594 Agro-food Supply Chain Design and Market Dynamics

Fei Qin, Student, McGill University, Canada
Mehmet Gumus, Associate Professor, McGill University, Canada
Saibal Ray, Professor, McGill University, Canada

Motivated by business model innovations for marginal farmers to sell their produces in developing countries, we examine the impact of a real-life channel format involving micro-entrepreneurs at both upstream and downstream stages that compete with the traditional channel on the farmers and end consumers in the presence of supply uncertainty.

396	Monday, 08:00 AM - 09:30 AM, Holmead East	<i>Track:</i> Service Operations
	<i>Session:</i> Strategic Consumer Behavior in Queues	
	<i>Chair(s):</i> Qiuping Yu	

060-0444 Sharing Delay Information in Services: A Field Study

Qiuping Yu, Assistant Professor, Indiana University, United States
Gad Allon, Professor, Northwestern University, United States
Achal Bassamboo, Associate Professor, Northwestern University, United States

We explore the impact of delay announcements by conducting a field experiment at a call center. To this end, we let the call center provide announcements to customers on certain days of the week, while provides no announcements to customers of the same type on other days of the week.

060-0537 De-biasing through Service Design
Michelle Shell, Student, Harvard University, United States
Ryan Buell, Professor, Harvard University, United States

Anxiety is commonly present during high-stakes decision-making. Yet, the extent to which anxiety undermines service coproduction is not well understood. In a series of laboratory experiments conducted in financial service settings, we document how anxiety biases service outcomes, and test a variety of design interventions to de-bias consumers.

060-0724 A Model of Rational Retrials in Queues
Shiliang Cui, Assistant Professor, Georgetown University, United States
Xuanming Su, Associate Professor, University of Pennsylvania, United States
Senthil Veeraraghavan, Associate Professor, University of Pennsylvania, United States

In many service settings, consumers usually have to wait in a queue to obtain the service. We study a single-server system with an observable queue where customers are allowed to retry in the future if the present line is too long. We characterize the equilibrium of such a queueing system.

060-1324 Managing Service Systems in Presence of Social Networks
Gad Allon, Professor, Northwestern University, United States
Dennis Zhang, Student, Northwestern University, United States

We study a service system with the presence of a social network. In our model, firms can differentiate resource allocations among customers, and customers learn the service qualities from the social network. We study the interplay among network structure, customer characteristics, and information structure, and characterize the optimal policy.

397	Monday, 08:00 AM - 09:30 AM, Holmead West	Track: Scheduling and Logistics
	Session: Vehicle Routing Problems	
	Chair(s): Lijun Sun	

060-0955 A Bi-objective Vehicle Routing Problem with Service Priority
Baoyu Ma, Student, Southeast University, China
Sijie Li, Associate Professor, Southeast University, China
Lindu Zhao, Professor, Southeast University, China

This paper proposed a new vehicle routing problem considered customers' urgency of demand for goods and the tolerance for goods arrival time. We used a modified goal programming approach for the formulation of the problem and a hybrid method to solve it.

060-0240 Heterogeneous Vehicle Routing Problem: A Fuzzy Heuristic Approach
Henrique Ewbank, Student, COPPEAD Graduate Business School, Brazil
Peter Wanke, Associate Professor, COPPEAD Graduate Business School, Brazil

This paper proposes a heuristic approach to the capacitated vehicle routing problem with heterogeneous fleet, using fuzzy c-means as clustering technique. Besides it uses genetic algorithm approach to determine the number of clusters and greedy algorithms for allocating customers to routes.

060-0978 A Multi-compartment Vehicle Routing Problem with Heterogeneous Vehicle Fleet for Product Oil Distribution
Lijun Sun, Associate Professor, Dalian University of Technology, China
Yuankai Zhang, Student, Dalian University of Technology, China

In China, urban distribution of product oil is realized by multi-compartment heterogeneous vehicles. Moreover, the distribution cost varies with distribution distance, vehicle's type and its loading quantity. A model considering the fuel consumption and vehicle-dispatching cost is proposed and a multi-phase heuristic is developed to find the satisfied solutions.

398	Monday, 08:00 AM - 09:30 AM, Kalorama	Track: Supply Chain Management
	Session: Supply Chain Contracting	
	Chair(s): Anupam Agrawal	

060-1327 Modularity and Contract Design
Tharanga Rajapakshe, Assistant Professor, University of Florida, United States
Anupam Agrawal, Assistant Professor, University of Illinois Urbana-Champaign, United States
Suresh Muthulingam, Assistant Professor, Penn State University State College, United States

When interdependent components are provided by different suppliers, then in the event of a product failure, warranty settlements between the buyer and the supplier(s) may be ambiguous. We analyze how modularity of components affects the contracting schema between a buyer and their supplier.

060-0767 The Impact of Market Value Concern on New Product Price Strategy with Revenue Sharing Contract
Taotao Li, Student, Huazhong University of Science & Technology, China
Jun Yang, Professor, Huazhong University of Science & Technology, China

We discuss how market value impacts new-product's pricing strategy. We characterize the equilibrium under a general contract, which shows the pricing strategy may be distorted. However, when a new contract with different slotting allowances is offered by the retailer, pricing distortion can be avoided and supply chain can achieve coordination.

- 060-0847** Utilization of Third-party Agent in Supplier Assessment
John Ni, Assistant Professor, University of Rhode Island, United States
Yuwen Chen, Associate Professor, University of Rhode Island, United States

This paper investigates whether a buyer should hire a third-party agent to monitor the supplier's product quality. By modeling the profit sharing decision for the buyer and quality decision for the buyer, we examine conditions under which utilizing a third-party agent is optimal for the buyer.

- 060-0886** Wholesale Pricing Strategies in the VMI Supply Chain with Price Sensitive Demand
ZeWen Cao, Associate Professor, National University of Defence Technology, China
ShiWei Zhao, Student, National University of Defence Technology, China

This paper considers the use of different wholesale pricing strategies to co-ordinate a Vendor Managed Inventory (VMI) supply chain with multiple heterogeneous retailers. Modelling the supply chain as a Stackelberg game with price sensitive demand, we introduce three pricing strategies: "differentiated pricing"; "fair differentiated pricing"; "volume discount pricing".

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| 399 | Monday, 08:00 AM - 09:30 AM, Jay | <i>Track:</i> Supply Chain Management |
| | <i>Session:</i> Supply Chain Network Design III | |
| | <i>Chair(s):</i> Yousef Ghiami | |

- 060-1592** Picking Productivity Estimation in Distribution Warehouses
Ashish Pingulkar, Student, National Institute of Industrial Engineering, Mumbai, India
Vivek Khanzode, Associate Professor, National Institute of Industrial Engineering, Mumbai, India

We examine problem of picking productivity estimation in distribution warehouse. We formulate model attempting to capture variability in picking operations using regression modeling. We consider two important order attributes: number of lines and number of cases for given order, and derive relation between time/case and cases/line for reserve warehouse setup.

- 060-1593** Designing Lean Buffers in Distribution Warehouse
Bhavin Shah, Student, National Institute of Industrial Engineering, Mumbai, India
Vivek Khanzode, Associate Professor, National Institute of Industrial Engineering, Mumbai, India

We examine forward-reserve warehouse design problem as applied to distribution warehouses. We attempt formulation of model addressing capacity and allocation issues from lean buffering perspective. Objective of the formulation is to investigate effects of buffer size variation on warehouse performance measures like response time and throughput.

- 060-1463** Impact of the Southeastern Automotive Supply Chain Network
Richard Monroe, Associate Professor, Longwood University, United States

Over the last three decades a number of automotive assembly plants have located in the southeastern states in the U.S. These location decisions are described along with the related location decisions by suppliers. In addition, infrastructure improvements have been completed and spillover effects have provided additional benefits to the region.

- 060-1278** An Inventory Routing Problem for Liquefied Natural Gas Distribution System
Yousef Ghiami, Student, Eindhoven University of Technology, Netherlands
Tom van Woensel, Professor, Eindhoven University of Technology, Netherlands
Marielle Christiansen, Professor, Norwegian University of Science And Technology, Norway

Due to its environmental characteristics and lower prices, Liquefied Natural Gas (LNG) is becoming a more attractive fuel. In this paper we develop an inventory routing model incorporating the deterioration property of LNG. A large neighbourhood search algorithm is developed to solve large instances of the problem.

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| 400 | Monday, 08:00 AM - 09:30 AM, Morgan | <i>Track:</i> Supply Chain Management |
| | <i>Session:</i> Supply Chain Coordination 5 | |
| | <i>Chair(s):</i> Dong Li | |

- 060-1558** Exploring Duplicate Orders in a Single-manufacturer Multiple-distributors Supply Chain
Sebastian Villa Betancur, Student, University of Lugano, Switzerland
Paulo Goncalves, Associate Professor, University of Lugano, Switzerland

Using a dynamic model and an anchoring and adjustment heuristic, we analyze how increases in final customer demand and following order duplications may dynamically influence performance in a single-manufacturer multi-distributor supply chain. We characterize the performances accounting for different duplication probabilities, times to build capacity and different manufacturer allocation mechanisms.

- 060-0360** Impact of Information Sharing on Logistics and Organizational Performance
Abdurrezzak Sener, Student, Wichita State University, United States
Mehmet Barut, Associate Professor, Wichita State University, United States
Mehmet Yildirim, Professor, Wichita State University, United States

Efficiency and effectiveness of logistics management is paramount to the success of retail industry. We couple this relation by investigating the impacts of information sharing on logistics performance. We examine this holistic relationship using empirical data from food retailers industry.

060-0385 A Supply Chain Network Game Theory Model with Outsourcing and Quality and Price Competition

Anna Nagurney, Professor, University of Massachusetts Amherst, United States

Dong Li, Student, University of Massachusetts Amherst, United States

We develop a supply chain network game theory model with product differentiation, outsourcing of production and distribution, and quality and price competition. The solution of the model provides each firm its optimal in-house quality, in-house and outsourced production and shipment quantities that minimize the operational cost and the weighted disrepute cost.

402

Monday, 08:00 AM - 09:30 AM, Oak Lawn

Track: Risk Management in Operations

Session: Managing Risks in Decentralized Supply Chain

Chair(s): Fabrizio Salvador

060-1050 Preventing Design Glitches from Generating External Quality Failures: The Role of Transactive Memory Systems

Diogo Cotta, Student, IE Universidad, Spain

Fabrizio Salvador, Professor, IE Universidad, Spain

Johnny Rungtusanatham, Professor, Ohio State University, United States

Design glitches are a source of uncertainty for the manufacturing function and a cause of external quality failures. We contend that organizations that activate transactive memory systems to mitigate glitches suffer less quality failures. We find support for our hypotheses combining secondary and primary data from 192 industrial equipment manufacturers

060-1290 Resilience Supplier Selection for a Make-to-Order Supply Chain

Christopher Kwaramba, Student, Virginia Polytechnic Institute And State University, United States

Milad Baghersad, Student, Virginia Polytechnic Institute And State University, United States

Christopher Zobel, Professor, Virginia Polytechnic Institute And State University, United States

S. Gregory Micheal, Data Scientist, Carter Machinery, United States

Selecting the optimal supplier base is critical to the success of Supply Chains. This paper proposes a bi-objective linear programming model addressing the supplier selection problem for a make-to-order supply chain facing disruption risk. We aim to show the impact of Supply Chain Visibility on Supply Chain Resilience.

060-0239 Passing the Buck: Transferring Unanticipated Purchasing Costs to Suppliers and Customers

Maria Fischl, Student, Institute of Technology Manageemnt, Switzerland

Ali Nazarpour, Student, University College Dublin, Ireland

Vahid Sohrabpour, Lecturer, Lund University, Sweden

Unanticipated procurement costs due to changes in input factors' market prices and exchange rates are an increasing issue for manufacturers. A popular strategy is transferring these price increases to the supply chain. Based on 12 interviews and a follow-up study, we identified the main enablers for manufacturers to do so.

407

Monday, 09:45 AM - 11:15 AM, Columbia 1

Track: Behavior in Operations Management*Session:* Teams and Leadership*Chair(s):* Jukka Hemilä**060-0034** Diversity of Individuals and Teams in the Service System Value Creation

Jukka Hemilä, Senior Scientist, Vtt Technical Research Centre of Finland, Finland

Service systems are dynamic configurations of people, technologies, organizations and shared information that create and deliver value to customers, providers and other stakeholders. Paper analyse the meaning of individuals and team diversity in the customer value creation and organisation performance. Paper is based on the literature and six case studies.

060-0620 Information Technology Project Management: Contributions of Humanistic Philosophy

Miriam Isida, Professor, UNIP, Brazil

Roberto Kanaane, Professor, CEETEPS, Brazil

Getulio Akabane, Retired, CEETEPS, Brazil

Helena Peterossi, Professor, CEETEPS, Brazil

The research aims to identify IT member's motivational levels with descriptive exploratory survey by closed end questionnaire. Then humanistic approach not only influences the formulation of human values but also contributes to individual's self-knowledge and self-improvement in organizational environment.

060-1018 Development of the Potential of People in Organizations: A Perception of the Leaders

Celi Langhi, Professor, CEETEPS, Brazil

Marcelo Masini Melo, Student, Centro Estadual de Educação Tecnológica Paula Souza, Brazil

This article presents a qualitative research, a survey type, which was developed with a group of leaders, who have been working in the areas involving Presidency, Directors, Senior Management and Educators, about their perceptions about the challenge that companies face in the pursuit of the development of the potential of people in organizations.

408

Monday, 09:45 AM - 11:15 AM, Columbia 2

Track: Closed Loop Supply Chains*Session:* Reverse Logistics and Networks for Product Recovery*Chair(s):* Yertai Tanai**060-0048** Decentralized Closed-loop Supply Chain with 3PLRLP

Yertai Tanai, Student, Kent State University, United States

Emmanuel Dechenaux, Associate Professor, Kent State University, United States

Eddy B. Patwuo, Professor, Kent State University, United States

Alfred Guiffrida, Associate Professor, Kent State University, United States

We consider a CLSC model where product returns are independently managed by a 3PRLP. We focus on commercial (resalable) returns and assume that a new product and a returned product are identical once the returned product has been processed by the 3PRLP.

060-0188 Petri Net (PN) Framework for Effective and Integrated Reverse Supply Chains

Jitendra Madaan, Assistant Professor, Indian Institute of Technology Delhi, India

Parikshit Charan, Assistant Professor, Indian Institute of Management Raipur, India

This paper proposes Petri net model models for a novel framework dedicated to reverse supply chains at the operational level. To this aim we consider a smart products equipped with sensors, RFID and communication networks and allowing them to remotely control end of life products recovery decisions.

060-1074 Reverse Logistics without a Proper Infrastructure – The Case of Used Lub Oil Plastic Containers in Brazil

Orlando Cattini Junior, Associate Professor, Fundacao Getulio Vargas, Brazil

According to Brazilian law, Fabricants, Importers, Distributors and Retailers are equally responsible for the collection and environmental correctly disposal of plastic containers for lubricant oil. The paper proposes a return chain structuring considering long distances to travel besides a lack of a proper logistic infrastructure.

409

Monday, 09:45 AM - 11:15 AM, Columbia 3

Track: Empirical Research in Operations Management*Session:* Manufacturing Empirical Research - II*Chair(s):* Carin Rösiö**060-0280** A Silver Lining in Product Recalls – A Study in the Consumer Product Industry

Adams Steven, Assistant Professor, University of Massachusetts Amherst, United States

The relationship between product recalls and profitability is investigated with emphasis on the existence of non-linearity and moderators as this relationship is unknown a-priori. The research suggests that firms may remain profitable or are even able to improve profits with a positive number of recalls as influenced by firm-specific characteristics.

060-1446 How Does Scope Link to Productivity? A Study of a Global Consumer Goods Manufacturer

Mikko Ketokivi, Professor, IE Universidad, Spain

Philip Bromiley, Professor, University of California Irvine, United States

Fabrizio Salvador, Professor, IE Universidad, Spain

Monday, 09:45 AM - 11:15 AM

Amrou Awaysheh, Assistant Professor, Indiana University, United States

Economies of scale and scope are two primary drivers of productivity of an operational facility. In this paper, we examine the joint effect of production line scale and facility scope on line productivity in the context of a global consumer goods manufacturer. Results from a fixed-effects panel model are presented.

060-1013 Early Production Involvement in New Product Development

Carin Rösiö, Assistant Professor, Mälardalens University, Sweden

Jessica Bruch, Assistant Professor, Mälardalen University, Sweden

In early phases of production system design important decisions are made that set prerequisites for the whole project. However, production engineers often gets involved when the decisions already are made. This paper aims to develop support for early production involvement founded on multiple case studies.

410

Monday, 09:45 AM - 11:15 AM, Columbia 4

Track: Retail Operations Management

Session: Inventory and Customer Satisfaction in E-Commerce

Chair(s): Nikunj Jain

060-0882 Compensation for Delivery Delay in Online Retailing

Baoyang Wang, Student, University of Science and Technology of China, China

Jin Qin, Associate Professor, University of Science and Technology of China, China

Internet retailer often faces the problem of delivery delays. Regardless of the causes, retailer needs to find an optimized recovery solution in order to satisfy customers who suffer from the delay. We study how much to compensate for delivery delays by considering order values and other key variables.

060-1669 Linking E-fulfillment Dimensions to Shopping Satisfaction and Repurchase Intention in E-tailing

Nikunj Jain, Student, Indian Institute of Management Indore, India

Hasmukh Gajjar, Associate Professor, Indian Institute of Management Indore, India

Bhavin Shah, Associate Professor, Indian Institute of Management Indore, India

This study addresses linkage between e-fulfillment dimensions (order procurement, order fulfilment and reverse service exchanges) and shopping satisfaction/repurchase intention of customers in e-tailing. The results establish partial mediating effect of shopping satisfaction between these dimensions and repurchase intention. The baseline model also analyse performance of these dimensions on repurchase intention.

060-0133 Study on Loyalty Management over Product Lifecycle Considering Customer Response to Product Stockouts

Berdymyrat Ovezmyradov, Student, University of Tsukuba, Japan

Hisashi Kurata, Associate Professor, University of Tsukuba, Japan

Considering the customer responses of backlogging, brand switching, and store switching to product unavailability, we explore the behavior of optimal order decisions of the supply chain members. Then, we present our findings on how firms manage customer loyalty according to the product lifecycle stage

412

Monday, 09:45 AM - 11:15 AM, Columbia 10

Track: Sustainable Operations

Session: Sustainability Driven Innovation

Chair(s): Paulo Gomes

060-1547 Knowledge Complementarities in Environmental Innovation

Jorge Rodriguez, Assistant Professor, Escuela Superior Politecnica Del Litoral, Ecuador

This paper studies the complementary effect of process innovation and collaboration with scientific organizations on environmental innovation. We use data from CIS survey in three countries: Germany, Estonia and Lithuania. Our results contribute to the debate of how firms could make their operations more sustainable with the environment.

060-1569 The Power of Innovation and Strategic Sustainability Positioning

Luciana Aparecida Barbieri, Student, Santa Maria Federal University, Brazil

Clandia Gomes, Professor, Santa Maria Federal University, Brazil

Jordana Kneipp, Student, Santa Maria Federal University, Brazil

Roberto Bichueti, Student, Santa Maria Federal University, Brazil

Ana Perlin, Student, Universidade Federal de Santa Maria, Brazil

The study investigates the relationship between the power of innovation and sustainability strategy of companies mining. The study is a survey research with companies associated with the Brazilian Mining Institute. The data analysis showed that companies with highly intensive characteristics of innovation have an offensive strategic approach towards sustainability

060-1338 New Products from Cleaner Production in Rectilinear Knitting Materials for Fashion Clothing

Ana Gentile, Student, Universidade De Sao Paulo, Brazil

Francisca Mendes, Professor, Universidade De Sao Paulo, Brazil

There is a growing concern about the problem caused by solid waste. Aiming to minimize the surplus of knitting raw materials generated within the textile cluster, crafts in the Creative Industries. One possibility of new products in the segment of rectilinear knitting, using the tools of Cleaner Production.

060-0195 Sustainability and Firm Performance: The Mediating Role of Innovation

Paulo Gomes, Lecturer, Babson College, United States

Graça Silva, Assistant Professor, ISEG Lisbon, Portugal

Do you need to innovate in order to profit from being green? This study investigates the mediating role of product and process innovation on the relationship between green supply chain management practices and firm performance. We consider inbound, outbound and production practices, and show distinct impacts for innovation.

415	Monday, 09:45 AM - 11:15 AM, Piscataway	Track: Inventory Management
	Session: Heuristics for Inventory Management	
	Chair(s): Randy Napier	

060-0826 Evaluating Alternative Inventory Replenishment Heuristics

Randy Napier, Assistant Professor, University of Texas Arlington, United States

Rajat Mishra, Assistant Professor, Stephen F Austin State University, United States

We compare alternative inventory replenishment heuristics against the classic EOQ lot sizing model. We simulate inventory system costs under different demand distributions in a multiple-item replenishment scenario. Simulation results are validated against three years of historical demand data for over 200 independent demand items from a manufacturing company.

060-0520 Using Statistical Inventory Models to Manage Spare Parts in Maintenance

Raimundo Sampaio, Professor, Pontifical Catholic University of Parana, Brazil

Rafael Wollmann, Student, Pontifical Catholic University of Parana, Brazil

Henrique Paiva, Student, Pontifical Catholic University of Parana, Brazil

Rui Marçal, Professor, Pontifical Catholic University of Parana, Brazil

One of the main challenges of maintenance planning is associated with spare parts inventory. This article comes to present a very promising approach using statistical inventory models to manage parts inventory, in order to help reduce costs and establish policies to prevent lack of spare parts.

060-1051 Sales Demand Forecasting in a Textile Factory Using Artificial Neural Network

Fábio Lima, Professor, Centro Universitario Da Fei, Brazil

João Chang Junior, Associate Professor, Centro Universitario Da Fei, Brazil

Sales demand forecasting is an important issue for manufacturing companies. Indeed, such forecasting is decisive in the management of the production systems. This work compares the performance of an Artificial Neural Network to traditional methods in forecasting the sales demand in a textile factory over a reduced data set.

416	Monday, 09:45 AM - 11:15 AM, Cardozo	Track: Information in Operations Management
	Session: Role of Information Technology in Process Improvement	
	Chair(s): Fabio Silva	

060-1178 How a Lean Six Sigma Program in a Carrier Enterprise IT Service Can Improve Productivity and Reduce Costs

Alexandre Barcelos, Student, CEETEPS, Brazil

Fabio Silva, Student, CEETEPS, Brazil

Napoleao Galegale, Professor, CEETEPS, Brazil

This case study is about a multinational company engaged in the provision of IT outsourcing services and the use of Six Sigma as a framework for their IT governance - and how it can improve productivity, cost reduction and operational performance in business processes for providing outsourced IT services.

060-0621 Information Systems for Supply Chain Management: A Literature Review and Critique

Mohammad Daneshvar Kakhki, Student, University of North Carolina Greensboro, United States

Vidyaranya Gargeya, Professor, University of North Carolina Greensboro, United States

Information systems play an important role in enhancing supply chain management. In the last 35 years, more than 500 papers have been written on the subject of information systems relating to supply chain management. This paper presents a systematic review and critique of that research.

060-1280 A Methodology for Planning, Choosing and Implementing BPM Solutions

Ricardo Cassel, Associate Professor, Federal University of Rio Grande do Sul, Brazil

Isadora Mariano, Student, Federal University of Rio Grande do Sul, Brazil

BPM is the discipline that embraces analysis, modelling, implementation, execution, monitoring and continuous improvement of business processes. Today many organizations have questions about what encompasses BPM. This paper presents a methodology for BPM deployment. The methodology covers from strategic planning to implementation of a process office for execution and control.

417	Monday, 09:45 AM - 11:15 AM, Du Pont	Track: Humanitarian and Not-for-profit Operations
	Session: The role of social media in humanitarian management	
	Chair(s): David Darcy	

060-0625 The Geographical Boundaries of Information on Social Media after Disaster Strikes

Eunae Yoo, Student, Arizona State University Tempe, United States

Elliot Rabinovich, Professor, Arizona State University Tempe, United States

During humanitarian crises, social media users upload local, real-time data. We study whether users' location imposes geographical boundaries on information dissemination by analyzing a large sample of Twitter posts from the 2013 Boston Marathon bombings. Our findings provide insight on how quickly humanitarians can access local data for operational decision-making.

060-1347 Application of TQM in DOM with Focus on Social Accountability

Muhammad Imtiaz Haq, Student, Lahore University of Management Sciences, Pakistan

Katrina report(Baker,2014) highlighted social accountability(SA) and related it to early response. Needs-response gap is studied focusing Pakistan's floods (2010) and earthquake(2005) representing predictability based disaster categories. Questionnaire/interview from agencies/NGOs,victims,and database of NDMA and ERRPA Pakistan is used. Pro-activeness of agencies/NGOs is analyzed using SA KPIs and two TQM models are suggested

060-1508 Evaluating Effective Solutions for Disaster Management: The Rationale for Social Media

Martin Starr, Emeritus Professor, Rollins College, United States

Sushil Gupta, Professor, Florida International University, United States

David Darcy, Assistant Professor, Florida International University, United States

Today's interactions are increasingly taking place via social media. Industry is working on integrating social media into doing business with interesting results, not always positive. We apply those lessons to disaster management and examine how it might benefit from wider adoption of social media. Directions for future research are suggested.

060-1557 Exploratory Analyses of Humanitarian Operations through Social Networks

Gloria Urrea, Student, University of Lugano, Switzerland

Sebastian Villa Betancur, Student, University of Lugano, Switzerland

Paulo Goncalves, Associate Professor, University of Lugano, Switzerland

We collected data from two humanitarian relief responses and 757 development projects to investigate how actors' attributes and network features affect organizations' performance in humanitarian operations. Findings revealed that project's performance increases with its centrality and the amount of money awarded; and decreases with project's duration and number of implementers.

418

Monday, 09:45 AM - 11:15 AM, Embassy

Track: Humanitarian and Not-for-profit Operations

Session: International cases in humanitarian disaster relief

Chair(s): Nonhlanhla Dube

060-0381 Treatment Facility Location and Resource Allocation for Epidemic Outbreaks: The Case of Haiti

Azrah Azhar, Student, George Washington University, United States

Miguel Lejeune, Associate Professor, George Washington University, United States

The cholera outbreak in Haiti in 2010 required quick response in locating treatment facilities across the country within a short period. This paper develops a location-allocation model for Haiti to locate 3 types of treatment facilities, considering limited resources, to supply equitable and efficient services to affected communities.

060-0020 Ten Case Studies of Foreign Field Hospitals

Michael Naor, Assistant Professor, Georgetown University, United States

A logistical problem in the context of supply chain for disaster relief is the delivery of critical health care services. In this study, through a series of ten case studies we juxtapose foreign field hospitals deployed by the Israel Defense Forces (IDF) at different countries.

060-1093 Resilience in Humanitarian Supply Chains: Insights from Overlapping Disaster Situations

Nonhlanhla Dube, Student, University of Groningen, Netherlands

Taco Van der Vaart, Associate Professor, University of Groningen, Netherlands

Ruud Teunter, Professor, University of Groningen, Netherlands

Kirstin Scholten, Assistant Professor, University of Groningen, Netherlands

We explore resilience in humanitarian supply chains (SC) by studying a SC which faced multiple overlapping disasters in 2010. Quantitative and qualitative methods are employed to assess resilience from a performance perspective and relate it to SC management practices respectively. Results reveal performance improvement explained by the SC's coping mechanisms.

419

Monday, 09:45 AM - 11:15 AM, Fairchild East

Track: Healthcare Operations Management

Session: Health analytic and empirical research

Chair(s): Brandon Lee

060-0423 Mitigating the Effects of Information Overload through Emphasis Framing: Theory and Evidence from Healthcare

Lauren Laker, Student, University of Cincinnati, United States

Craig Froehle, Professor, University of Cincinnati, United States

Christopher Lindsell, Professor, University of Cincinnati, United States

Jaime Windeler, Assistant Professor, University of Cincinnati, United States

Big data and ubiquitous information technology can cause knowledge workers to suffer from information overload. A novel tactic called "emphasis framing" is introduced to mitigate the effects of information overload. Lab experiments are used to test the concept in a healthcare setting.

060-0466 Vignette as a Complementary Application of Decision Analysis in a Healthcare Co-creation Survey

Antonio Silva, Student, Universidade De Sao Paulo, Brazil
Milton Farina, Professor, USCS, Brazil
Denis Donaire, Professor, USCS, Brazil
Maria Gouvea, Associate Professor, Universidade De Sao Paulo, Brazil
Edson Kubo, Professor, USCS, Brazil

Vignettes have been used on healthcare surveys when people have to balance conflicting values, sort through complex situations and deal with uncertainty. According to similar procedures, it was reported details to refine them. They were applied in order to provide a way of minimizing the differential item functioning in surveys.

060-0895 A Study of How Healthcare Failure Mode and Effect Analysis (HFMEA™) Affects Performance of Hospital Processes

Brandon Lee, Student, Clemson University, United States
Lawrence Fredendall, Professor, Clemson University, United States

This study examines whether goal specificity and scoring subjectivity affect HFMEA team's collective-efficacy which in turn could reduce the risk of the target process. Through a lab study, the effect of HFMEA goals such as hazard score, criticality, effective control and detectability will be evaluated.

060-0936 Healthcare Analytics Model for Efficient Preventive Test Management

Sanjeev Bordoloi, Associate Professor, University of St. Thomas, United States
Arati Kadam, Student, University of St. Thomas, United States

Health policy experts suggest that analytical models and smarter primary-care can lead to lower healthcare costs, without comprising quality of life. Decision-making tools help insurance companies perform predictive analysis to derive optimal levels of preventive tests. We developed a model to help healthcare companies make better judgment on recommended tests.

420

Monday, 09:45 AM - 11:15 AM, Fairchild West

Track: Healthcare Operations Management

Session: Competition and resource allocation in healthcare settings

Chair(s): Jayakanth Srinivasan

060-0389 Managing Clinical Professionals in the Face of an Increasing Competitive Orientation: A Study of USA Hospitals

David Dobrzykowski, Assistant Professor, Rutgers University, United States
Kathleen McFadden, Professor, Northern Illinois University, United States

The competitive orientation of hospitals is increasing given industry changes. Capitalizing on a competitive orientation hinges on the effective management of clinical professionals. Our study posits that autonomy and motivation are key mediators capable of translating a competitive orientation into patient satisfaction. Data collected from USA hospitals provides useful insights.

060-1169 A Three-layered Network Model on Healthcare Resource Allocation from Equalizing Perspective

Yuyao Fan, Student, Southeast University, China
Lindu Zhao, Professor, Southeast University, China

This paper aims at solving the healthcare resource unfairly allocated problem across urban and rural areas in China. A three-layered network including village hospital, community health center and general hospital is established through location-allocation model. With resources sharing and scheduling, we'll maximize the quantity of people covered by different resources.

060-1302 Bone Marrow Transplant with Finite Waiting Rooms

Bo Li, Student, Texas A&M University College Station, United States
Antonio Arreola-Risa, Associate Professor, Texas A&M University College Station, United States

We model the bone marrow transplantation division of a medical research center as a queuing system with random patient arrivals and random lengths of stay. We consider settings with fixed number of patient waiting rooms and fixed/variable number of transplant rooms and maximize aggregated patient health benefits.

060-1373 Enabling Mental Health Practice Management

Jayakanth Srinivasan, Senior Lecturer, Massachusetts Institute of Technology, United States

We use a limited data set for mental health service provision in the Army to highlight the limitations of heuristics based capacity planning approaches. We apply simulation modeling and data analytics to refine capacity planning in the context of multidisciplinary teaming and handoffs between primary and specialty care.

421

Monday, 09:45 AM - 11:15 AM, Gunston East

Track: Product Innovation and Technology Management

Session: Managing the NPD Process

Chair(s): Kimberly Whitehead

060-1084 An Empirical Study on Leader Attention Scope, Transformational Leadership and Innovation Ambidexterity

Xiaofeng Zheng, Student, University of Science & Technology, China
Zhiying Liu, Professor, University of Science & Technology, China
Chaoliang Ma, Student, University of Science & Technology, China

Guided by the upper echelons theory and the attention theory, this paper empirically proved the positive effect leader attention scope (LAS) on innovation ambidexterity (exploratory innovation and exploitative innovation), considering the mediating role of transformational leadership. Environmental dynamism was also considered to assess the effectiveness of transformational leadership.

060-0033 Product, Process and Organizational Innovations in Embedded Systems Engineering

Jukka Hemilä, Senior Scientist, Vtt Technical Research Centre of Finland, Finland

Paper focuses on manufacturing industries providing complex embedded systems. Embedded systems are composed of mechanical, electronic, software and service components. Paper tackles the challenges that manufacturing companies are facing in the management of their product, process and organizational innovations. Research is based on the literature and a case study.

060-0638 Understanding the Role of Distributive Capability in New Product Development

Kimberly Whitehead, Assistant Professor, Anderson, SC, United States

Studies have shown mixed results regarding the role of absorptive capacity in new product development. It is hypothesized here that these mixed results have arisen due to the one-sided nature of absorptive capacity. This research studies the role of absorptive capacity alongside its complement distributive capability in new product development.

422

Monday, 09:45 AM - 11:15 AM, Gunston West

Session: Sourcing and Newsvendor Strategies

Chair(s): Fariborz Partovi

Track: Marketing and OM Interface

060-0029 The Effect of Global Sourcing on Ethical Consumption

Robert Bregman, Associate Professor, University of Houston, United States

Xiaosong (David) Peng, Assistant Professor, University of Houston, United States

This research evaluates consumer perceptions and responses to common cost-driven global sourcing decisions. We extend the Hunt-Vitell model of ethics to establish a structural equation framework of consumers' ethical decision-making and apply normal mixture model based cluster analysis to data from a survey to identify four separate ethical decision-making segments.

060-1089 Selective Newsvendor Problem with Quantity-dependent Leadtime and Marketing Decisions

Jianing Zhi, Student, University of Alabama Tuscaloosa, United States

Burcu Keskin, Associate Professor, University of Alabama Tuscaloosa, United States

We consider a selective newsvendor problem with limited sales force and quantity-dependent leadtime to maximize the expected profit for a company. We evaluate our models with demands, capabilities of agents, leadtime, and waiting time tolerance of customers to estimate their impacts on the profit, ordering policies, and marketing decisions.

060-1686 An Analytic Network Process Approach to Human Resource Planning

Fariborz Partovi, Professor, Drexel University, United States

This paper presents a mathematical model for Strategic workforce planning. The model, which is based on Analytic network process, incorporates the following elements: market segments, customer wants, various departments in an organization, and human expertise. The major contribution of the proposed model is the use of mathematics as part of a formal process for the strategic recruitment of various workforce requirements within an organization.

423

Monday, 09:45 AM - 11:15 AM, Coats

Session: Game Theoretic Economic Models

Chair(s): James Fan

Track: Economics Models of Operations

060-0782 Why Maximizing TBL is an Unachievable Target : An Explanation Based on Game Theory and Utility Model

Ayesha Wadood, Student, Lahore University of Management Sciences, Pakistan

The identified benefits of TBL and ways to accomplish it have little value if it is unachievable. This paper uses game theoretic framework and utility based model to demonstrate that despite that maximized "shared value" is higher than "Individual values," rational and opportunist individuals will never seek to maximize TBL.

060-0631 Differential Game Model of Software Quality with Competitive Digital Vendors

James Fan, Student, Penn State University University Park, United States

Christopher Griffin, Professor, Applied Research Lab, United States

We model duopolistic competition between two software vendors as a differential game. Both firms seek to maximize market share and profit through effort towards software quality, which is quadratic in cost. We derive theoretical results and use numerical examples to highlight the relationships between market share and quality dedication.

425

Monday, 09:45 AM - 11:15 AM, Holmead East

Session: Non-profit Service Industries

Chair(s): Karuna Jain

Track: Service Operations

060-1260 Higher Education Service Quality: A Framework

Narendra Lakal, Student, Indian Institute of Technology Bombay, India

Karuna Jain, Professor, National Institute of Industrial Engineering, Mumbai, India

Higher education is a high contact service involving longer durations and high intensity of customer contact. In this paper, we present the service quality dimensions of higher education (technical) in India based on qualitative research and propose a hierarchical service quality framework.

060-0497 Criminal Justice Supply Chains – Exploring Characteristics and Contingencies

Aline Seepma, Student, University of Groningen, Netherlands
Carolien De Blok, Assistant Professor, University of Groningen, Netherlands
Dirk Pieter van Donk, Professor, University of Groningen, Netherlands

Public services are perceived to function badly. However, little is known about their functioning, especially in chains such as criminal justice chains. Explorative case studies in four European countries provide insight in challenges faced by organizations in criminal justice systems when managing processes and professionals along the service supply chain.

060-0246 Adaptation of the Balanced Scorecard (BSC) to the Context of Higher Education Institutions (HEI's) Brazil

Tonny Rodrigues, Associate Professor, Federal University of Rio De Janeiro, Brazil
Átila Lira, Associate Professor, Faculdade Santo Agostinho, Brazil
Irenilza Nâas, Professor, UNIP, Brazil

The expansion in the education of Brazilian higher education system led HEI's to appropriate business strategies adopted by organizations in other segments, especially for BSC. However, the managers of these organizations still question: how to adapt this tool to the Brazilian IES's reality?

060-0162 A Group Concept Mapping of Shared Services in a Cooperative: A Mixed Method Perspective

Marie-Pierre Spooner, Associate Professor, Universite Du Quebec A Montreal, Canada
Martin Cloutier, Associate Professor, Universite Du Quebec A Montreal, Canada

The objective is to contribute a greater understanding of shared services in cooperatives. Results of a group concept mapping study, using a mixed-method bottom-up perspective with multivariate statistics, investigate the scope of professional service needs in the portfolio and implications for operations and organization of professional services within a cooperative.

426

Monday, 09:45 AM - 11:15 AM, Holmead West

Track: Scheduling and Logistics

Session: Activities to Engage Students in Large Operations Management Classes

Chair(s): Charles Munson

060-1349 Activities to Engage Students in Large Operations Management Classes

Charles Munson, Professor, Washington State University Pullman, United States

This interactive workshop will allow attendees to participate in several activities as though they were students in a large operations management class. Demonstrated games will include "Improving Conditions for the Dice Game," "Reliability Choices," and "The e-Counting Game." These activities have successfully engaged as many as 100 students in class.

427

Monday, 09:45 AM - 11:15 AM, Kalorama

Track: Supply Chain Management

Session: Sustainable Supply Chains 3

Chair(s): Kazim Sari

060-0073 A Decision Framework for Evaluating Green Logistics Practices

Kazim Sari, Associate Professor, Beykent University, Turkey

This study aims to develop a decision framework for the managers to evaluate green logistics practices. To this end, a hybrid fuzzy multiple-criteria decision making method is used along with a Monte Carlo simulation.

060-1626 Improving Agricultural Supply Chain Performance through Project Management Knowledge Areas

Vivekanand Khanapuri, Associate Professor, National Institute of Industrial Engineering, Mumbai, India

Inefficiencies in Agricultural Supply Chains (ASC) are identified through literature. A conceptual frame work is proposed to identify the distinguishable relationship between the Performance parameters of ASC and the Project Management knowledge areas. The focus is to improve performance through application of Project Management approaches.

060-0110 Who Should Build the Network of Charging Stations for EVs, Manufacturer or Dealer?

Tian Wang, Student, Huazhong University of Science & Technology, China
Shiming Deng, Professor, School of Management, Huazhong University of Science of Technology, China

We investigate an issue of how to facilitate the expansion of charging networks for Electric Vehicle (EV). In particular, who should build the charging networks, manufacturer or dealer, to alleviate range anxiety? We study this from supply chain perspective and provide strategies leading to a larger market acceptance of EVs.

060-0685 The Role of IT and Supply Chain Integration in Reducing Environmental Uncertainties in Supply Chain Settings

Odkhishig Ganbold, Student, Yokohama National University, Japan
Yoshiki Matsui, Professor, Yokohama National University, Japan

In supply chain context, environmental uncertainty is an inherent condition of inter-firm interactions, that can bring inefficient processing, unreliable information and non-value adding activities to supply chain. This study examines the role of IT and supply chain integration in reducing environmental uncertainty in terms of demand, supply and technology uncertainties.

429

Monday, 09:45 AM - 11:15 AM, Morgan
Session: Supply Chain Coordination 6
Chair(s): Mohammad Firouz

Track: Supply Chain Management

- 060-1512** Joint Planning and Problem Solving Roles in Supply Chain Collaboration
Gopal Kumar, Senior Lecturer, Dublin City University, Ireland
Rabindra Banerjee, Professor, Indian Institute of Technology Kharagpur, India
Purushottam Meena, Assistant Professor, New York Institute of Technology, United States
John Geraghty, Lecturer, Dublin City University, Ireland

This research investigates evolution of collaborative culture (CC) in supply chain. The model is validated with industry data using PLS method. Findings show that joint problem solving and measurement are critical in developing CC and executing effective planning. Joint planning at operation level is very important in culture development.

- 060-1177** Capacity Allocation for Order Acceptance in Real Time
Rajesh Srivastava, Professor, Florida Gulf Coast University, United States
Elias Kirche, Associate Professor, Florida Gulf Coast University, United States

Real time order management in an integrated supply chain is focused on profit maximization. We examine the issue of capacity allocation between lower and higher profitability orders in the order acceptance decision with an objective of minimizing real time overhead costs and opportunity costs under varying order arrival patterns.

- 060-1107** An Integrated Supplier Selection and Inventory Problem with Multi-sourcing and Lateral Transshipments
Mohammad Firouz, Student, University of Alabama Tuscaloosa, United States
Burcu Keskin, Associate Professor, University of Alabama Tuscaloosa, United States
Sharif Melouk, Associate Professor, University of Alabama Tuscaloosa, United States

We study a supplier selection problem of a firm with multiple warehouses. We allow for multi-sourcing and lateral transshipments to mitigate the risks that arise from supplier quality, capacity, and disruptions. Our simulation-optimization based approach shows cost saving opportunities with multi-sourcing and lateral transshipments under different disruption scenarios.

- 060-1041** Bundling of Transport and Its Impact on Inventories and Cost Allocation in Horizontal Supply Chain Partnership
Silvia Padilla Tinoco, Student, Katholieke Universiteit Leuven, Belgium
Robert Boute, Associate Professor, Vlerick Management School, Belgium
Stefan Creemers, Associate Professor, IESEG School of Management, France

We study a setting where two companies coordinate their replenishments using a can-order policy. We analyze the impact on both transportation costs and inventory requirements. We investigate how each company's cost savings are influenced by their horizontal relationship and by the allocation mechanism that is used to distribute the gains

430

Monday, 09:45 AM - 11:15 AM, Northwest
Session: Revenue Management for Airlines
Chair(s): So Yeon Chun

Track: Revenue Management and Pricing

- 060-0634** Dynamic Pricing with Time-inconsistent Consumers
Xiangyu Gao, Student, University of Illinois Urbana-Champaign, United States
Xin Chen, Associate Professor, University of Illinois Urbana-Champaign, United States
Ying-Ju Chen, Associate Professor, Hong Kong University of Science & Tech, Hong Kong

We propose a dynamic pricing model in which consumers exhibit time-inconsistent behaviors, which is modeled by quasi-hyperbolic discounting, and may be partially aware of their self-control issues. We characterize the subgame perfect equilibrium. Consumers' time-inconsistent behaviors boost the seller's profit. However, consumers' naivete may undermine the seller's profitability.

- 060-1570** A Static Model in Single-leg Flight Airline Revenue Management
Behrooz Pourghannad, Student, University of Michigan Ann Arbor, United States
Semih O. Sezer, Associate Professor, Sabanci University, Turkey
J.B.G Frenk, Associate Professor, Sabanci University, Turkey

We present a static single-leg airline revenue management. Requests for fare classes arrive according to independent non-homogeneous Poisson processes where cancellation and no-shows are considered. The objective is to find an optimal closing time(s) which maximizes the expected net revenue. We consider the time-dependence of the demand.

- 060-0183** Dynamic Management of Loyalty Programs
So Yeon Chun, Assistant Professor, Georgetown University, United States
Dan Iancu, Assistant Professor, Stanford University, United States
Nikolaos Trichakis, Assistant Professor, Harvard Business School, United States

Originally viewed as marketing tools, loyalty programs have grown significantly in scope, and currently affect (and are affected by) many other functions of firms, including operations, accounting and finance. We develop a dynamic model that captures these interactions, analyze the structure of the optimal policy, and discuss managerial implications.

431	Monday, 09:45 AM - 11:15 AM, Oak Lawn	Track: Risk Management in Operations
	Session: Supply Chain Risk Management - Theories and Frameworks	
	Chair(s): Christoph Bode	

- 060-0302** Quantitative Framework for Managing Value, Risks, and Opportunity of a Supply Chain
Aloysius Lee, Student, National University of Singapore, Singapore
Mark Goh, Professor, National University of Singapore, Singapore
Nengsheng Zhang, Senior Researcher, Singapore Institute of Manufacturing Technology, Singapore

This study develops a framework for monitoring supply chain Value, Risks, and Opportunity in terms of the key attributes affecting the stakeholders. Doing so provides organizations with a method to filter, organize, and analyze essential information to facilitate better supply chain planning and control.

- 060-1367** A Review of the Literature on Supply Chain Resilience: Major Findings and Future Directions
Masoud Kamalahmadi, Student, North Carolina A&T State University, United States
Mahour Mellat-Parast, Assistant Professor, North Carolina A&T State University, United States

The purpose of this paper is to review the exiting body of knowledge in supply chain resilience. The research answers two key questions in supply chain resilience: 1) The current state-of-the art in supply chain resilience, and 2) The existing gaps and future research directions.

- 060-1425** Risk in Supply Chain: A Theoretical Analysis of Definitions and Typologies
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

Supply chain risk management has recently gained attention but still presents several theoretical gaps, especially regarding fundamental concepts of risk. This theoretical paper discusses the definitions and typologies of risk in supply chain based on current specific literature, in order to develop a comprehension of categories and approaches.

- 060-1307** Stages of Supply Chain Disruption Response: Direct, Constraining, or Mediating Factors for Impact Mitigation?
Christoph Bode, Professor, Universitat Mannheim, Germany
John Macdonald, Assistant Professor, Michigan State University, United States

Which is more important after a supply-chain-disruption: Working through all recovery stages quickly, or are some stages more important than others? Using survey data, we analyze direct and mediating effects of decision-making speed on disruption impact, and whether any of the stages act as a constraining factor to the others.

437

Monday, 11:30 AM - 01:00 PM, Columbia 2

Track: Closed Loop Supply Chains*Session:* Product Recovery and Reuse in Closed-Loop Supply Chains*Chair(s):* Yasutaka Kainuma**060-0223** The Cascade Reuse Supply Chain at Fuji Xerox: A Stochastic Analysis

Yasutaka Kainuma, Associate Professor, Tokyo Metropolitan University, Japan

Stephen Disney, Professor, Cardiff University, United Kingdom

We develop and study a dynamic stochastic model of the production, collection, disassembly and remanufacture of photocopiers produced and sold in Japan and Thailand. We consider the inventory requirements and costs of saleable products as well as capacity requirements and costs in production, collection, disassembly and remanufacture in both countries.

060-0643 Use of Sensors for Cell Phones Recovery

Mehmet Talha Dulman, Student, Northeastern University, United States

Surendra Gupta, Professor, Northeastern University, United States

This study highlights the importance of sensors in cell phones recovery. Sensors provide lifetime information on cell phones when they are embedded in them while being manufactured. This information is useful when disassembling end-of-life cell phones and remanufacturing them. That results in significantly reduced inspection and disassembly costs.

060-0659 Optimal Pricing for Reusable and Recyclable Products using Nonlinear Physical Programming

Bandar Alkhayyal, Student, Northeastern University, United States

Surendra Gupta, Professor, Northeastern University, United States

This research uses Physical Programming to solve a multi-criteria decision making problem to optimize the pricing policy of reusable and recyclable products to maximize their total profit and minimize their product recovery costs - including disposal cost, preparation cost, holding cost, disassembly cost, acquisition cost, and sorting cost.

060-0951 Decision Model for Risk Analysis in Product Recovery Systems (PRS)

Jitendra Madaan, Assistant Professor, Indian Institute of Technology Delhi, India

Despite these reported facts organizations are still reluctant in incorporating sustainable practices due to risks associated with PRS. To address these issues, the paper attempts to identify these risks associated with PRS and proposes a flexible decision model for risk analysis, which can assist organizations in the successful implementation of recovery practices.

438

Monday, 11:30 AM - 01:00 PM, Columbia 3

Track: Empirical Research in Operations Management*Session:* Inventory and Forecasting*Chair(s):* Isaac Elking**060-0297** A New Forecasting Management Construct and Its Impact on Accuracy, Operational and Delivery Performance

Torsten Doering, Assistant Professor, Daemen College, United States

Nallan Suresh, Professor, SUNY at Buffalo, United States

In this empirical study, forecasting management is defined as a new higher-order construct, and its relationships with three dependent constructs are analyzed in a nomological network based on primary data. Forecasting accuracy is tested both as a mediator and moderator, and a multigroup analysis is utilized to explore data heterogeneity.

060-0351 The Inventory-performance-Link at Security Offerings

David Bendig, Student, RWTH Aachen University, Germany

Malte Brettel, Professor, RWTH Aachen University, Germany

We conduct an empirical study based on US manufacturing companies to assess the impact of inventory management on the financial performance of equity offering firms. Equity offerings represent crucial corporate events with large information asymmetries. We find evidence that inventory performance helps to mitigate information asymmetries regarding post-offering financial performance.

060-1298 Inventory as Information: An Agency Theory Perspective

Alan Cannon, Associate Professor, University of Texas Arlington, United States

Inventory performance as an indicator of organizational performance has come under increased scrutiny (with mixed results) in the last five years. In this study, the information content of inventory performance is explored via agency theory. Results suggest that well-informed outsiders are sensitive to inventory performance when pricing firm loans.

060-1391 Market Entry and Strategic Inventory: An Empirical Investigation of the US Airline Industry

Isaac Elking, Student, University of Maryland, United States

Yan Dong, Assistant Professor, University of South Carolina, United States

Chen Zhou, Assistant Professor, University of South Carolina, United States

We investigate the role of inventory capacity decisions as strategic firm choices. Specifically, we examine how firms can make use of inventory policy as a strategic tool to affect market entry/exit decisions by their competitors. Our analysis makes use of empirical methods and archival data from the U.S. airline industry.

439

Monday, 11:30 AM - 01:00 PM, Columbia 4

Track: Retail Operations Management*Session:* Managing Retail Operations*Chair(s):* Michael Sternbeck**060-0158** Efficient Workforce Scheduling in the Retail Store

Peeyush Pandey, Student, Indian Institute of Management Indore, India

Hasmukh Gajjar, Associate Professor, Indian Institute of Management Indore, India

Bhavin Shah, Associate Professor, Indian Institute of Management Indore, India

Ashish Sadh, Professor, Indian Institute of Management Indore, India

A workforce-scheduling problem in the retail store is proposed considering overstaffing and understaffing. Further, the problem becomes more complex and difficult to solve due to uncertain and uneven customer traffic, union contracts, labor laws, company policies etc. Optimization model and solution methodology are developed to arrive at efficient schedule.

060-0055 Can Old Dogs Learn New Tricks? Exploring New Process Implementation in a Large Retail Chain

Megan Lawrence, Student, Harvard University, United States

We know that change is costly, history matters, and knowledge transfers unevenly within firms. One result of these traits within firms may be difficulty implementing new processes. Using data from a large retail company, I examine the impact of organizational, managerial, and environmental factors on new process implementation.

060-0590 Product Allocation to Distribution Centers in Retail Logistics Networks

Michael Sternbeck, Lecturer, Catholic University of Eichstaett-Ingolstadt, Germany

Andreas Holzapfel, Lecturer, Catholic University of Eichstaett-Ingolstadt, Germany

Heinrich Kuhn, Professor, Catholic University of Eichstaett-Ingolstadt, Germany

We consider the problem of assigning stock keeping units (SKUs) to distribution centers belonging to different distribution stages in a retail network, i.e., central or regional. The modeling approach reflects the interdependencies between inbound transportation, outbound transportation and instore logistics as well as capital tied up in inventories.

441

Monday, 11:30 AM - 01:00 PM, Columbia 10

Track: Sustainable Operations*Session:* Effective Green Investments*Chair(s):* Christoph Schmidt**060-0437** Supply Chain Position and Green Investments

Birte Schaltenbrand, Student, Ebs Business School, Germany

Christoph Schmidt, Student, Ebs Business School, Germany

Kai Foerstl, Professor, Ebs Business School, Germany

Corporate green investments are influenced by several contingency factors. Based on a survey we further explore these factors from a supply chain perspective. Especially we investigate how the focal firm's focus on different types of green investments is influenced by its supply chain position.

060-1158 Incubating and Implementing Successful and Sustainable Programs for Social Benefit: Towards a Social Resource-based View of the Firm

Wendy Tate, Associate Professor, University of Tennessee Knoxville, United States

Lydia Bals, Professor, University of Applied Sciences, Germany

Coverage of economic and ecological dimensions are particularly strong in the supply chain literature, whereas the social dimension of remains underrepresented. Case studies of social businesses funded by Yunus Social Business were performed with results showing that social resources play a significant role in triple bottom line sustainable supply chains.

060-0919 Short-term vs. Long-term Gains or Short-term & Long-term Gains: Balanced Sustainability Framework

Lin WU, Student, Nottingham University, China

Nachiappan Subramanian, Associate Professor, Nottingham University, China

Muhammad Abdulrahman, Assistant Professor, Nottingham University, China

Chang Liu, Associate Professor, Nottingham University, China

Kul Pawar, Assistant Professor, University of Nottingham, United Kingdom

Sustainability consists of both short-term and long-term profitability achieved in an environmentally-friendly and socially-responsible way. Based on case studies, this study proposes a sustainability capability framework for achieving Triple-Bottom-Line (3BL). It employed a Chinese philosophy of balance, Yinyang, to explain the balance between the seemingly conflicting short-term and long-term gains.

060-0398 Fostering Green Innovation: An Integrated Environmental Governance and Institutional Theoretical Perspective

Michael Ng, Student, The Hong Kong Polytechnic University, China

Venus Lun, Assistant Professor, The Hong Kong Polytechnic University, China

Kee-hung Lai, Associate Professor, The Hong Kong Polytechnic University, China

T.C.E. Cheng, Professor, The Hong Kong Polytechnic University, China

Drawing upon environmental governance (EG) and institutional theory, we propose an integrated framework for examining green innovation adoption (GI) in the shipping industry. We theoretically hypothesize and empirically investigate the interplay between the antecedents and GI. This study reveals that EG plays a pivotal role in determining and mediating GI.

442	Monday, 11:30 AM - 01:00 PM, Columbia 11	Track: Sustainable Operations
	Session: Sustainable Strategic Decision Making	
	Chair(s): Jenyi Chen	

060-1497 Identifying Strategic Factors of the Implantation CSR in the Airline Industry: The Case of Asia-Pacific Airlines

Dong-Shang Chang, Professor, National Central University, Taiwan, Republic of China

Chen Sheng-Hung, Student, National Central University, Taiwan, Republic of China

Hsu Chia-Wei, Associate Professor, Tungnan University, Taiwan, Republic of China

Hu Allen H., Professor, National Taipei University of Technology, Taiwan, Republic of China

Dow Jones Sustainability Indices presented the corporate social responsibility (CSR) performance of Asia-Pacific airlines can be improving. By applying decision-making trial and evaluation laboratory method, the key strategic factors in implementing CSR of airline industry is found. The key finding has proved by interviews with senior managers of global airlines.

060-0942 Supply Chain Disclosure and Ethical Sourcing

Jenyi Chen, Assistant Professor, Cleveland State University, United States

Susan Slotnick, Professor, Cleveland State University, United States

This research explores the question of whether ethical sourcing and disclosure of supply-chain sources is linked to competitiveness. We investigate the tradeoffs involved and the incentives for a firm to disclose the nature of its sourcing in response to its costs, market structure, and the characteristics of its competitors.

060-1427 Environmental Subsidy and the Choice of Green Technology in the Presence of Green Consumers

Gongbing Bi, Associate Professor, University of Science and Technology of China, China

Minyue Jin, Student, University of Science and Technology of China, China

Liuyi Ling, Professor, University of Science and Technology of China, China

Feng Yang, Associate Professor, University of Science and Technology of China, China

We study a government's subsidy policy to motivate firms' adoption of green emissions-reducing technology when consumers are environmentally discerning. Two cases when the government has limited or sufficient budget to choose firm(s) to provide subsidy are considered.

060-1069 Exploring the Development of Corporate Environmental Management

Ana Soares, Student, Fundacao Getulio Vargas, Brazil

There are pressures from public sector and the civil society to include environmental variables in management of corporate practices. Companies can provide different approaches to deal with environmental problems and different evolutionary stages. This article aims to identify the differences of this stages, and their development in Brazilian companies.

445	Monday, 11:30 AM - 01:00 PM, Cardozo	Track: Information in Operations Management
	Session: Information Technology and Service Innovations in Operations Management	
	Chair(s): Sunil Mithas	

060-0748 Management of Logistics Costs - Interdependencies across Practice Bundles

Sriram Narayanan, Associate Professor, Michigan State University, United States

Takehisa Kajiwara, Professor, Kobe University, Japan

Ranjani Krishnan, Professor, Michigan State University, United States

We employ the notion of practice bundles to examine the inter-relationships between logistics costs and their performance outcomes. We use a unique dataset of logistics practices from Japanese organizations for the period 2004-2011. We show that implementing a practice bundle results in both positive and negative cost externalities.

060-0926 Network Effects of Information Sharing Across Hospitals

Pankaj Setia, Associate Professor, University of Arkansas - Fayetteville, United States

Nirup Menon, Associate Professor, George Mason University, United States

This study examines how sharing of information across a network of healthcare providers influences efficiency and effectiveness of service creation in a hospital. Archival data from different sources, such as annual American Hospital Association (AHA) IT survey and CMS, is used to assess these effects across various healthcare networks.

060-1003 Managing Service System Debt for Orchestrating Service Innovation Projects

Narayan Ramasubbu, Assistant Professor, University of Pittsburgh, United States

In this study we explore the influence of design capital embedded in service systems on the success of service innovation projects. Using case studies of six service innovation projects spanning different industries, we investigate how the firms orchestrated their service innovation projects.

060-1561 Demand and Revenue Impacts of an Opaque Channel: Empirical Evidence from the Airline Industry

Nelson Granados, Associate Professor, Pepperdine University, United States

Monday, 11:30 AM - 01:00 PM

Kunsoo Han, Associate Professor, McGill University, Canada

Dan Zhang, Assistant Professor, University of Colorado Boulder, United States

We use a market response model and a massive dataset of economy class reservations from a major international airline to empirically examine the demand generation and cannibalization effects of the opaque channel. We also develop a methodology to assess the revenue impacts of the opaque channel.

446

Monday, 11:30 AM - 01:00 PM, Du Pont

Track: Humanitarian and Not-for-profit Operations

Session: Case studies in humanitarian operations

Chair(s): Marilyn Helms

060-0964 Failure to Prevent Train Derailment and Crude Oil Explosion

Willard Price, Professor, University of Pacific, United States

The main question for this research is "why do we fail to prevent major disasters?" Several case studies have been developed, with this case presenting an inquiry into a recent accident in Quebec, Canada involving train derailment and explosion of volatile gases in tank cars containing crude oil.

060-1053 Humanitarian Operations in Brazil - A Review of Natural Disasters in the Last Decade

Priscila Miguel, Lecturer, Fundacao Getulio Vargas, Brazil

Renata Brito, Lecturer, Eaesp - Fgv, Brazil

Susana Pereira, Associate Professor, Fundacao Getulio Vargas, Brazil

Renata Silva, Student, Fundacao Getulio Vargas, Brazil

This research used documentary analysis to identify the main natural disasters in Brazil in the last decade (2003 to 2013). Results provided evidence that operations and impacts differ in sudden-onset and slow-onset disasters and that Government is the main player in the Humanitarian Operations in Brazil.

060-1346 Classifying Humanitarian Supply Chains for Optimal Effectiveness: A Case Study of Guatemala

Stephen LeMay, Professor, University of West Florida, United States

Marilyn Helms, Professor, Dalton State College, United States

Michael Dwyer, Student, University of West Florida, United States

We classified 13 Guatemalan NGOs interviewed about their humanitarian supply chain operations. We define the criteria used to describe each organization as "To" (task oriented and ignore context and people), "For" (value process over people), and "With" (develop long-term relationships and help clients solve their own problems).

447

Monday, 11:30 AM - 01:00 PM, Embassy

Track: Humanitarian and Not-for-profit Operations

Session: Social & Operational Issues in the Public and Non-Profit Sectors

Chair(s): Samantha Meyer

060-0740 Education System Intervention Modeling

Pratik Mital, Student, Georgia Institute of Technology, United States

Roxanne Moore, Research Engineer II, Georgia Institute of Technology, United States

Donna Llewellyn, Professor, Georgia Institute of Technology, United States

Schools and school districts are complex, dynamic systems affected by numerous factors. In this work, a framework is developed that can be used to analyze interventions in the K-12 education system in US. The framework is applied to various case studies to identify intervention barriers and enablers.

060-0788 Data-driven Modeling to Improve Elementary School External Resource Acquisition

Samantha Meyer, Student, Northwestern University, United States

Karen Smilowitz, Associate Professor, Northwestern University, United States

Using both interview and survey data from 9 urban elementary schools, we model the problem of how schools can best acquire needed resources from community organizations and other external groups that work to provide schools with grant money, materials, volunteers, expertise, etc.

060-1434 Guiding School-choice Reform through Novel Applications of Operations Research

Peng Shi, Student, Massachusetts Institute of Technology, United States

In 2012, Boston launched a school-assignment reform. After attending community meetings, I proposed a plan based on optimization, and later simplified it so that the school board could take ownership in it. I also analyzed various plans by simulation. After debate, my plan was adopted and implemented in 2014.

060-1353 The Pennsylvania Adoption Exchange Improves Its Matching Process

Vincent Slaugh, Student, Carnegie Mellon University, United States

Mustafa Akan, Associate Professor, Carnegie Mellon University, United States

Onur Kesten, Associate Professor, Carnegie Mellon University, United States

Utku Unver, Professor, Boston College, United States

Child case worker surveys and child outcome data demonstrate significant operational challenges to matching children in state custody with adoptive families. Using a simulation model and a spreadsheet tool, we justify the value of a statewide network and detail improvements to increase the percentage of children who are successfully adopted.

448

Monday, 11:30 AM - 01:00 PM, Fairchild East

Track: Healthcare Operations Management*Session:* Predictive models in hospital operations*Chair(s):* Franklin Warren**060-0273** Using Artificial Neural Network in Length of Hospital Stay Prediction for Cardiology Patients

Pei-Fang Tsai, Assistant Professor, National Taipei University of Technology, Taiwan, Republic of China

Kai-Ying Chen, Professor, National Taipei University of Technology, Taiwan, Republic of China

In hospital bed management, early identification of patients' risk during hospitalization could facilitate optimal use of hospital beds. One critical factors before admission is to determine length of stay (LOS). Using artificial neural network models, this research tried to identify predictors of LOS for patients in cardiology department before admission.

060-0534 Predicting Length of Stay Using Logistic Regression and Decision Trees

Franklin Warren, Student, Virginia Polytechnic Institute And State University, United States

Roberta Russell, Professor, Virginia Polytechnic Institute And State University, United States

Quinton Nottingham, Associate Professor, Virginia Polytechnic Institute And State University, United States

This research uses logistic regression to build classification and regression trees for a vocational rehabilitation facility interested in predicted length of stay (LOS) for its clients. The results are compared to previously constructed regression trees based on client characteristics.

060-1565 Predictive Data Modelling for Health Care

Shivanand Hiremath, Professor, National Institute of Industrial Engineering, Mumbai, India

Rahul Gupta, Student, National Institute of Industrial Engineering, Mumbai, India

Soubhik Chakraborty, Student, National Institute of Industrial Engineering, Mumbai, India

The Objective is to predict future hospitalization needs so that better health care plans can be developed to mitigate hospitalization risks. For this study, a predictive model is developed with data mining techniques and tested with 'claims data for insurance'-patient data health group competition.

449

Monday, 11:30 AM - 01:00 PM, Fairchild West

Track: Healthcare Operations Management*Session:* Empirical research for hospital management*Chair(s):* Claire Senot**060-0484** Supplier-side View on DART as Antecedent to Co-creation: Empirical Study with Indian Hospital-suppliers

Samyadip Chakraborty, Student, IFHE University, India

David Dobrzykowski, Assistant Professor, Rutgers University, United States

Ryan N. Schmidt, Assistant Professor, Valdosta State University (GA), United States

In the Indian healthcare context, our empirical study explores how the building-blocks of co-creation, namely dialogue, access, risk-assessment and transparency, impact the trust, commitment and co-creation activities in the course of the transaction relationship between the hospital-suppliers and their customers (i.e. hospitals) in the B-2-B context from the perspective of the hospital-supplier, using a service-dominant logic lens.

060-0589 Hospital Efficiency in Dubai: The Impact of Organization and Management

Alessandro Ancarani, Associate Professor, University of Catania, Italy

Carmela Di Mauro, Associate Professor, University of Catania, Italy

Ali Ayach, Employee, Health Department under the Dubai Government Administration, United Arab Emirates

Paolo Mancuso, Associate Professor, University of Rome - Tor Vergata, Italy

Simone Gitto, Assistant Professor, University of Rome - Tor Vergata, Italy

We study how hospital wards' technical efficiency is related to organizational and managerial factors. Data from 66 hospital wards in Dubai are used to calculate efficiency scores through DEA. Scores are regressed on goals and constraints, as perceived by the head-of-ward, and on ward reorganizations, showing how they affect efficiency.

060-1466 Determining and Analyzing Causes of Hospital Closures

Dinesh Pai, Assistant Professor, Penn State University at Harrisburg, United States

Hospital closures continue to be an important area of research. Closures affect not only the immediate patients but also the larger community. In this study we use a probit model to test our hypothesis that less efficient hospitals would be the one that do not survive over time.

060-1709 Pursuing Conformance Quality and Experiential Quality during the Delivery of Health Care: A Multiple-case Study

Claire Senot, Assistant Professor, Tulane University, United States

Aravind Chandrasekaran, Assistant Professor, Ohio State University, United States

Peter Ward, Professor, Ohio State University, United States

Research shows hospitals benefit from simultaneously pursuing conformance and experiential quality. Findings from a multiple-case study in the heart failure units of five acute care hospitals suggests that a disease-focus challenge experienced by physicians and a hierarchical challenge experienced by nurses impede caregivers' ability to combine conformance and experiential quality.

450

Monday, 11:30 AM - 01:00 PM, Gunston East

Track: Product Innovation and Technology Management*Session:* Innovation Research in Emerging Industry Contexts*Chair(s):* Ana Claudia Amancio**060-0742** A Supply Chain Design and Optimization for Non-reactor-Based Production of Tc-99m Medical Imaging Isotope

Reza Mahjoub, Assistant Professor, University of Alberta, Canada

Katie Gagnon, Assistant Professor, University of Alberta, Canada

Sandy McEwan, Professor, University of Alberta, Canada

Christopher McCabe, Professor, University of Alberta, Canada

We study Tc-99m medical isotope supply chain when the isotope is produced by non-reactor-based technologies. We investigate the optimal solutions for quantity, capacity and location of the production nodes, i.e., cyclotrons or linear accelerators, as well as for proportions of radioactive activity allocated from those nodes to each demand point.

060-1153 New Trends in Automotive Embedded System

Antonio Galhardi, Professor, Centro Estadual de Educação Tecnológica Paula Souza, Brazil

Marília Azevedo, Professor, Centro Estadual de Educação Tecnológica Paula Souza, Brazil

Getulio Akabane, Retired, CEETEPS, Brazil

The advances in Information and Communication Technology - ICT, had been made, and a range of applications involving automotive embedded computing can emerge. The recent trends mean that a further range of applications will become feasible in the near future. Particularly, the applications involving communication amongst large numbers of vehicles.

060-1111 Education, Research and Practice between Higher Education Institution and Business Entity

Jose Massaroppe, Professor, Universidade Metodista De Sao Paulo, Brazil

José Alberto Claro, Professor, UNIFESP - Universidade Federal de São Paulo, Brazil

This work, relating the concepts of teaching and research and business practice, studied, based on the Regional Strategic Plans and the guidelines of the National Plan Postgraduate, the process of integration of scientific knowledge between firms and a higher education institution Grande ABC Paulista (Brazil).

060-1282 Centered Innovation in User Apparel Fashion

Ana Claudia Amancio, Student, Universidade De Sao Paulo, Brazil

Francisca Mendes, Professor, Universidade De Sao Paulo, Brazil

Rita Moro, Student, University of São Paulo, Brazil

Fashion clothing firms need efficient managements strategies aligned with consumer needs with innovative strategies related to technology. The proposal will be evaluating the performance of an electronic loom knitting in large-scale production with the customize option, by choosing points, drawings and modeling.

452

Monday, 11:30 AM - 01:00 PM, Coats

Track: Economics Models of Operations*Session:* Using Economic Models in Operations*Chair(s):* Drew Stapleton**060-0535** The Role of Information Technology in Supporting Green Initiative - The Stochastic Production Frontier Approach

Chia-Ching Chou, Student, Suny At Buffalo, United States

Winston Lin, Professor, Suny At Buffalo, United States

Previous studies in the field of Information technology (IT) and eco-friendly issues investigated the effects of IT on energy consumption or pollution. Based on resource-based view, theory of production, and stochastic production frontier approach, this study proposes to empirically assess the supporting effect of IT on green initiative.

060-1607 Revisiting Ocean Liner Shipping: Is the Core Still Empty?

Drew Stapleton, Professor, University of Wisconsin La Grosse, United States

I review ocean liner shipping 16 years post OSRA and discuss the implications on pricing and container supply management in light of an empty core. Game theoretical implications are examined.

060-1083 The Impact of Anchors Stores in the Performance of Shopping Centers

João Chang Junior, Associate Professor, Centro Universitario Da Fei, Brazil

Claudia Mattos, Assistant Professor, Centro Universitario Da Fei, Brazil

Marcos Cassas, Student, Centro Universitario Da Fei, Brazil

This work determines the impact of anchor stores in the performance and results of eight Brazilian malls between 2007 and 2009 as well as its influence on the results of satellite stores, through panel data. The work demonstrates that satellite stores rental price is influenced by anchor stores rental price.

060-1409 The Benefit of Trust in Professional Service Contract

Ting Luo, Student, University of Texas Dallas, United States

This paper investigates the value of hiring professional service firms and why their clients should trust them. A professional service firm has knowledge and experience advantages over the client firm. That makes the contracting process involve not only the information asymmetry, but also the knowledge asymmetry.

456

Monday, 11:30 AM - 01:00 PM, Kalorama

Track: Supply Chain Management*Session:* Service Supply Chains*Chair(s):* Carlos Ernani Fries**060-1431** On the Relationship between Efficiency and Cold Chain Management Services

Carlos Ernani Fries, Associate Professor, Federal University of Santa Catarina, Brazil

Fernanda Christmann, Student, Federal University of Santa Catarina, Brazil

Willian dos Santos, Student, Federal University of Santa Catarina, Brazil

Temperature-controlled logistics providers (TCLP) offer specialised cold chain management services. This paper aims to establish the relationship between bundles of logistic services and efficiency of TCLP that have operated in Brazilian cold supply chains from 2003 to 2014. Statistically significant relationships were obtained with Data Envelopment Analysis and regressions models.

060-0692 Stochastic Differential Game Analyses of Logistics Service Supply Chain Coordination by Cost Sharing Contract

Haifeng Zhao, Associate Professor, Tongji University, China

Dan Chen, Student, Tongji University, China

This paper studies the coordination of logistics service supply chain by cost sharing contract with stochastic differential game. A stochastic differential game model is established with the logistics service supply chain that consists of one service integrator and one supplier.

060-1234 Resource Sharing in Power Rental Service

Ruoxuan Wang, Assistant Professor, San Diego State University, United States

Janice Carrillo, Associate Professor, University of Florida, United States

Due to the high frequency of supply chain disruptions from power outages, demand is increasing for the temporary power equipment market. We investigate the capacity allocation plan for the supplier providing power rental service to multiple buyers. The availability of a contract work as a signal concerning the supplier's capacity.

060-0887 Demand Disruption and Coordination of a Service Supply Chain

Tianyi Wei, Student, University of Science and Technology of China, China

Jin Qin, Associate Professor, University of Science and Technology of China, China

We find that positive demand disruption makes double marginalization worse. To address this problem, we propose a two-part tariff contract under which the client pays the vendor a fee besides the wholesale price if the service rate were met. Results show that the contract can achieve channel coordination.

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Monday, 11:30 AM - 01:00 PM, Morgan

Track: Supply Chain Management*Session:* Supply Chain Resilience*Chair(s):* Steve Melnyk**060-0008** Investment Decision for Supply Chain Resilience Based on Evolutionary Game theory

Xiaowei Ji, Student, Huazhong University of Science & Technology, China

We study the factors and improvement methods of supply chain resilience, then analyze the investment decisions between supply chain members based on the Evolutionary Game theory. We deduce that the government should use punitive and subsidy methods to control supply chain members' behaviors and enhance the resilience of supply chain.

060-0009 Empirical Study of Supply Chain Resilience's Influence on Corporate Profits

Xiaowei Ji, Student, Huazhong University of Science & Technology, China

We study the performance of the supply chain resilience, then analyze a conceptual model of supply chain resilience which is about how supply chain resilience influence corporate profits. The model is empirically tested on the base of data collecting from multi-industry and modified according to preliminary calculations.

060-0427 Management Capabilities in Supply Chain Resilience

Marcio Santos, Assistant Professor, Instituto Federal de Mato Grosso - IFMT, Brazil

Rosane Lúcia Alcantara, Associate Professor, Universidade Federal De São Carlos, Brazil

This paper aims to understand the capabilities that enables supply chain resilience. By systematic literature review in 22 select papers, between 2000-2013, we have identified the major capabilities: flexibility (supplier; product; process; transportation), collaboration (information sharing; joined decision making; working together); structure of chain (physical; information) and agility (visibility; velocity).

060-0898 Understanding Supply Chain Shocks and Resilience: Theory-building through Experimental Based Simulation

Christopher Zobel, Professor, Virginia Polytechnic Institute And State University, United States

Steve Melnyk, Professor, Michigan State University, United States

Stanley Griffis, Associate Professor, Michigan State University, United States

John Macdonald, Assistant Professor, Michigan State University, United States

An approach aimed at facilitating theory building involving risk, shocks and resilience is presented. This approach consists of three components: (1) framework; (2) discrete event simulation; and, (3) analysis of differenced time series data. This approach is illustrated using a simple simulation model of a supply chain system experiencing shocks.

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Monday, 11:30 AM - 01:00 PM, Northwest
Session: Pricing and Contract Design
Chair(s): Wenbo Cai

Track: Revenue Management and Pricing

- 060-1458** An Allocation Model for the Optimal Value of Lithium Phosphate Battery
Dong-Shang Chang, Professor, National Central University, Taiwan, Republic of China
Menghong Lee, , National Central University, Taiwan, Republic of China

An allocation model is proposed to optimize the total revenue of lithium phosphate secondary battery between the stage of the power source use on Electrical Vehicle EV and the stage of energy storage system. The sensitive analysis of prices on two stages is also investigated.

- 060-0957** Counteracting Strategic Purchase Deferrals: The Impact of Online Retailers' Return Policy
Mehmet Altug, Assistant Professor, George Washington University, United States
Tolga Aydinliyim, Assistant Professor, Baruch College, United States

In an online retailing context, we study return management decisions when consumers are discount seeking and sensitive to stock-outs. We find that allowing returns enhances profit if the retailer can salvage with a mild discount, and the ability to do so is a strategic advantage in case of competing retailers.

- 060-0822** Revenue Sharing for Cancer Treatments between Equipment Manufacturers and Hospitals
Ling-Chieh Kung, Assistant Professor, National Taiwan University, Taiwan, Republic of China

We study a contracting problem for a manufacturer to sell/rent an equipment for cancer treatments to a hospital. The impacts of the manufacturer's private reliability information and the hospital's private downstream pricing decisions are addressed by a game-theoretic model. The popular revenue sharing contract is particularly studied.

- 060-0460** The Impact of Endogenous Secondary Markets on Retailer's Profitability
Mehmet Altug, Assistant Professor, George Washington University, United States
Garrett van Ryzin, Professor, Columbia University, United States

One main assumption in the newsvendor model is that the salvage value is exogenous and retailers can sell their excess stock at this fixed salvage value. However, the salvage value of excess stock is mostly determined endogenously. We compare consolidated secondary markets vs. store clearance with myopic and strategic customers.

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Monday, 11:30 AM - 01:00 PM, Oak Lawn
Session: Managing Risk in Energy Industry
Chair(s): Mario Ferrer-Vásquez

Track: Risk Management in Operations

- 060-1315** A Consumer Survey for Utility Estimation on Retail Electricity Pricing
Osman Kazan, Assistant Professor, Tulane University, United States
Kathryn Stecke, Professor, University of Texas Dallas, United States
Metin Cakanyildirim, Professor, University of Texas Dallas, United States
Ozalp Ozer, Professor, University of Texas Dallas, United States

250 surveys are carried out to map consumers' electricity usage patterns. They are asked to schedule daily household tasks under constant and time-of-use (TOU) prices. The results help to estimate consumers' utility in a TOU pricing model. An optimal pricing scheme is established for peak load reduction in power grids.

- 060-1329** Integrated Operational and Financial Hedging in Crude Oil Procurement Risk Management
Xiaocong Ji, Student, Tsinghua University, China
Ignacio Grossmann, Professor, Carnegie Mellon University, United States
Simin Huang, Professor, Tsinghua University, China

In this research, we provide an integrated operational and financial hedging strategy which uses inventory, nonlinear distillation, and three derivatives to hedge procurement risk caused by oil price volatility. Numerical experiments based on real world data are tested, which verify the benefit of the proposed approach and provide useful insights.

- 060-1070** Oil Supply Chain Risk Management Practices in the Kingdom of Saudi Arabia
Mario Ferrer-Vásquez, Assistant Professor, Alfaisal University, Saudi Arabia
Ricardo Santa, Assistant Professor, Alfaisal University, Saudi Arabia
Alvaro Sierra, Assistant Professor, Universidad Simón Bolívar, Colombia
Daniel Romero, Student, University of South Florida, United States
Julio Daza-Escorcia, Student, University of Valencia, Spain

This investigation has a twofold purpose: to operationalize the constructs of the of Supply-Chain-Risk-Management (SCRM), Supply-Chain-Resilience (SCR) and Supply-Chain-Vulnerability (SCV), and to quantitatively test the nature as well as the strength of the relationship between these three constructs within the context of the oil-industry in the Kingdom of Saudi Arabia.