Sessions for Saturday, May 04

Saturday, 08:00 AM - 09:30 AM

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Saturday, 08:00 AM - 09:30 AM, Piscataway Track: Closed Loop Supply Chains

Invited Session: New Topics in CLSC

Chair(s): Neil Geismar James Abbey

093-1407 A Blockchain-Based Framework for Implementing Extended Producer Responsibility

Behzad Esmaeilian, Lecturer, Western New England University, United States
Jianzhou Qi, Student, University at Buffalo, SUNY, United States
Sara Behdad, Assistant Professor, University at Buffalo, SUNY, United States

The limited engagement of obliged companies, non-cooperation between important stakeholders, and no transparency have been among impediments of implementing Extended Producer Responsibility (EPR). The study discusses a Blockchain-based framework for traceability of products and authentication that products belong to particular OEMs towards practical implementation of EPR and product take-back.

093-1761 Waste-Pickers' Role on Brazilian Solid Waste Closed Loop Systems

Mônica Luna, Associate Professor, Federal University of Santa Catarina, Brazil
Diego Vazquez-Brust, Professor, Federal University of Santa Catarina, United Kingdom
Lucila Campos, Associate Professor, Federal University of Santa Catarina, Brazil

Brazilian Solid Waste Policy (BSWP) requires insertion of waste-pickers in waste collection systems. We use qualitative research in 4 types of waste to study factors influencing waste-pickers' role in closed loop waste systems (e.g. collection options, market price for recyclable waste). Causal loop diagrams are used to visualize that influence.

093-0441 Improving Remanufacturing Core Recovery and Profitability Through Seeding

James Abbey, Assistant Professor, Texas A&M University College Station, United States
Neil Geismar, Associate Professor, Texas A&M University College Station, United States
Gilvan Souza, Professor, Indiana University Bloomington, United States

Durable goods firms sell new products as remanufactured at the start of a new product lifecycle to start efficient remanufacturing earlier and to fulfill demand for remanufactured products earlier. The cost of producing a new unit and the product lifecycle curve determine profitability of seeding.

093-0442 Strategic Design of Multiple Lifecycle Products for Remanufacturing Operations

M. Serkan Akturk, Assistant Professor, Clemson University, 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

A product's level of remanufacturability depends on design paradigm, e.g., design for remanufacturing versus design for assembly. We analytically investigate how the optimal design choice depends on the interactions of market conditions (competition, clockspeed, product value) with characteristics of design paradigms (time-to-market, manufacturing and remanufacturing costs).

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Saturday, 08:00 AM - 09:30 AM, Oak Lawn Track: Marketing and Operations Management

Contributed Session: Economic Models in Marketing and Operations Management

Chair(s): Philipp Baumann

093-0014 Interaction of Contract Types and Store-Brand Introduction

Yugang Yu, Professor, University of Science and Technology of China, China
Fuqiang Zhang, Professor, Washington University St Louis, United States
Shengming Zheng, Student, University of Science and Technology of China, China

This paper studies the downstream RM's optimal store-brand introduction decision in two different contracts, wholesale-price contract and agency-selling contract. In wholesale-price contract, the downstream firm can set the retail price for the national-brand and store-brand if the firm chooses to introduce store-brand.

093-0465 The Strategic Analysis of Logistics Service Sharing in an E-Commerce Platform

Xuelian Qin, Student, Huazhong University of Science & Technology, China
Zhixue Liu, Professor, Huazhong University of Science & Technology, China
Lin Tian, Associate Professor, Fudan University, China

Recently, the e-commerce market has emerged with a new trend of business-to-business logistics service sharing – the hybrid platform shares a self-supporting logistics service system with its marketplace sellers. In this paper, we develop an analytical model to examine the strategic and economic implications of logistics service sharing between the platform and the seller.

093-2457 Managing Demand with an Upgrade Program in the Presence of a Product Rollover

Liming Wang, Student, Tsinghua University, China
Yongbo Xiao, Associate Professor, Tsinghua University, China
Jihong Zhang, Professor, Beijing Foreign Studies University, China

Upgrade program is the trade-in practice which provides customers with the option to upgrade to new product with a pre-determined discount. We examine the effectiveness of this program with the consideration of uncertain salvage price and investigate how production cost and the market size of loyalty customers affect its profitability.

093-2362 Softening Online Retailer Competition with Referral Services

Kihoon Kim, Associate Professor, Korea University, South Korea

This paper investigates when and whether referral services may soften the competition between two online retailers. We show that the sizes of loyal consumer groups, the degree of their loyalty, and the cost distribution determine the equilibrium strategies.

093-1837 Optimal Customer Selection for Direct Marketing Campaigns

Philipp Baumann, Associate Professor, University of Bern, Switzerland
Tamara Bigler, Student, University of Bern, Switzerland
Manuel Kammermann, Student, University of Bern, Switzerland

In direct marketing, companies promote products or services by contacting customers personally via direct mail, emails, or phone calls. The selection of customers to be targeted has a strong impact on the effectiveness of the direct marketing activities. We propose a mathematical model for optimally assigning customers to activities.

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Saturday, 08:00 AM - 09:30 AM, Northwest Track: POM in Food and Agriculture

Contributed Session: Financial Management in Agriculture

Chair(s): Xiaoyan Qian

093-0411 Dynamic Pricing and Volume Allocations in the Dairy Industry

Shigeru Tsubakitani, Sr. Scientist, PROS Inc., United States

Streamlining production and operations in the dairy industry face many challenges due to the complexity of the multitude of processes involved. We design a novel, demand-driven approach for one of the world's foremost dairy producers by integrating biweekly production planning and real-time revenue management systems to maximize expected margins.

093-0070 Industry Analysis for Restaurant Business

Sangdo Choi, Assistant Professor, Christopher Newport University, United States
Daehee Kim, Assistant Professor, Christopher Newport University, United States

We analyze restaurant industry in North America using an Earns-Turns Matrix. Inventory turnovers are very high compared with other industries. The restaurant industry is growing and diverse. Big firms in the restaurant industry (e.g., McDonald's, Panera Bread, Wendy's) have improved profitability as well as operational excellence. We analyze industry trends in the restaurant business.

093-1593 Contractual Coordination of Agriculture Cooperatives with Quality Provisions

Xiaoyan Qian, Assistant Professor, Dongbei University of Finance and Economics, China
Tava Olsen, Professor, The University of Auckland, New Zealand

This work investigates the contractual coordination of an agricultural marketing co-op when a quality standard is specified in its contract with farmers who can exert quality-related effort at the farm level. It proposes a two-stage stochastic model characterized with multi-period payment scheme and farmers' time preferences.

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Saturday, 08:00 AM - 09:30 AM, Morgan Track: Public Sector Operations Management

Invited Session: Children and Public Policy

Chair(s): Vincent Slaugh

093-0939 Investing in Performance: Information and Merit-Based Incentives in K-12 Education

Vanitha Virudachalam, Student, University of Pennsylvania, United States
Sergei Savin, Professor, University of Pennsylvania, United States
Matthew Steinberg, Assistant Professor, University of Pennsylvania, United States

We examine the relationship between information on student performance and monetary incentives for teachers using a two-period principal-agent model. We establish that for low-performing schools, the return from merit-based incentives is always greater than that from information via interim assessments. For high-performing schools, we identify settings where information is demotivating.

093-1387 Economic Assessment of Policies to Prevent Childhood Lead Poisoning

George Miller, Institute Fellow, Altarum, United States
Corwin Rhyan, Senior Analyst, Altarum, United States

We estimate the annual economic burden of childhood lead exposure in the U.S. to be $84 billion and identify the potential for residential lead prevention and remediation policies to cut lead exposure levels for young children, resulting in significant long-term economic benefits and in many cases positive net societal returns.

093-1507 Integrating Vehicle Routing and Scheduling to Optimize Foster Care Visitations

Caroline Johnston, Student, Worcester Polytechnic Institute, United States
Shima Azizi, Student, Worcester Polytechnic Institute, United States
Renata Konrad, Assistant Professor, Worcester Polytechnic Institute, United States
Katharine Dunphy, Student, Worcester Polytechnic Institute, United States
Andrew Trapp, Associate Professor, Worcester Polytechnic Institute, United States

We solve a real foster care visitation scheduling problem using combinatorial concepts from the team orienteering problem. By generating the tours based on drivers and case workers availability, while also respecting child and parent availability at multiple locations, we determine a feasible schedule that maximizes the number of weekly visits.

093-0867 Learning and Earning for Child Adoption Matching

Vincent Slaugh, Assistant Professor, Cornell University, United States

Utku Unver, Professor, Boston College, United States
Onur Kesten, Associate Professor, Carnegie Mellon University, United States

We study the problem of choosing a family to recommend as a possible adoptive match for a child and focus on the trade-off between learning and earning when selecting a family given the family's history of rejections. We also provide lessons learned from pilot implementations of the Family-Match platform.

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Saturday, 08:00 AM - 09:30 AM, Kalorama — Track: Emerging Topics in Operations Management

Invited Session: Smart City Operations: Ride Sharing and Autonomous Vehicles

Chair(s): Soo-Haeng Cho

093-0855 Robust Vehicle Allocation with Uncertain Covariates

Zhaowei Hao, Post Doc/Researcher, National University of Singapore, Singapore
Long He, Assistant Professor, National University of Singapore, Singapore
Zhenyu Hu, Assistant Professor, National University of Singapore, Singapore
Jun Jiang, Student, National University of Singapore, Singapore

Motivated by a leading taxi operator in Singapore, we consider the idle vehicle allocation problem with uncertain demands and other uncertain covariate information such as weather. We employ a novel distributionally robust optimization approach that utilizes historical covariate information via multivariate regression tree and validate its performance using real data.

093-0935 A Queueing Model and Analysis for Autonomous Vehicles on Highways

Neda Mirzaeian, Student, Carnegie Mellon University, United States
Soo-Haeng Cho, Associate Professor, Carnegie Mellon University, United States
Alan Scheller-Wolf, Professor, Carnegie Mellon University, United States

We investigate the effects of autonomous vehicles (AVs) on highway congestion. We develop a multi-lane queueing model and calibrate the model to data. We compare the performance of two policies both analytically and numerically: designating a lane to AVs, and allowing AVs to drive on any lane together with regular vehicles.

093-2119 The Impact of the Gig-Economy on Financial Hardship Among Low Income Households

Kaitlin Daniels, Assistant Professor, Washington University St Louis, United States
Michal Grinstein-Weiss, Professor, Washington University St Louis, United States

The expansion of the gig-economy (i.e. marketplaces for on-demand service, like Uber) provides value to workers by offering flexibility, but circumvent traditional employee protections (e.g. the minimum hourly wage). We empirically measure the effect of gigs on workers' ability to meet their short-term financial obligations.

093-2186 We Are on the Way: Analysis of On Demand Booking Systems

Guiyun Feng, Student, University of Minnesota, United States
Guangwen Kong, Assistant Professor, University of Minnesota - Twin City, United States
Zizhuo Wang, Assistant Professor, University of Minnesota, United States

We compare the matching efficiency of on-demand ride-hailing systems to the traditional street-hailing systems. We approximate the on-demand ride hailing and street hailing using an M/M/K state dependent service rate and further propose adding response caps to improve the matching efficiency

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093-2458 Pricing Shared Bikes: Profit vs. Social welfare Management

Shuping Ding, Student, Tsinghua University, China
Yongbo Xiao, Associate Professor, Tsinghua University, China

This paper studies the impact of service level and bike quality on a shared bike firm’s performance. We build a model to study the optimal pricing strategy for a monopolist firm to maximize profit or social welfare and find when the firm is better off by implementing the optimal strategy.

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Saturday, 08:00 AM - 09:30 AM, Jay — Track: Retail Operations

Invited Session: Promotional Activities in Retailing

Chair(s): Olga Perdikaki

093-0039 Management and Effects of In-Store Promotional Displays

Oguz Cetin, Student, University of North Carolina Chapel Hill, United States
Adam Mersereau, Associate Professor, University of North Carolina Chapel Hill, United States
Ali Parlakturk, Associate Professor, Kenan-Flagler Business School, United States

This work examines a brick-and-mortar retailer's choice of product to include in a promotional display. Retailers need to understand the promotional display problem because it is a powerful demand-shaping lever. In our paper, we develop analytical insights using nested multinomial logit model of customer choice.

093-0403 Welfare Implications of Inventory-Driven Dynamic Pricing

Yannis Stamatopoulos, Assistant Professor, University of Texas Austin, United States
Naveed Chehrazi, Assistant Professor, University of Texas Austin, United States
Achal Bassamboo, Associate Professor, Northwestern University, United States

This paper illustrates that when pricing decisions are made in conjunction with other operational decisions, dynamic pricing can result in increased system efficiency which can pass through to consumers. We demonstrate this point in a brick-and-mortar retail setting by extending the EOQ model to accommodate dynamic pricing.

093-1124 Optimizing SKU Selection for Promotional Display Space at Grocery Retailer

Olga Pak, Student, University of South Carolina, United States
Mark Ferguson, Professor, University of South Carolina, United States
Olga Perdikaki, Assistant Professor, University of South Carolina, United States
Su-Ming Wu, Scientist, Oracle, United States

Promotional displays are a powerful tool to boost consumer engagement. As a result, we propose a methodology to identify a profit-maximizing selection of products for promotional display using grocery store sales transaction data. Our methodology results in substantial improvement in profit when compared to an industry benchmark

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093-1962 Estimating Customer Trends to Target Promotions

Lennart Baardman, Student, Massachusetts Institute of Technology, United States
Setareh Borjian, Researcher, Oracle, United States
Tamar Cohen, Student, Massachusetts Institute of Technology, United States
Kiran Panchamgam, Senior Scientist, Oracle, United States
Georgia Perakis, Professor, Massachusetts Institute of Technology, United States

Trends in fashion can help determine effective personalized promotion plans. We introduce a personalized demand model that captures customer-trends from transaction data, which allows us to draw causal inference on the effects that targeted promotions have. The promotion targeting is hard problem, so we propose an efficient greedy algorithm.

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Saturday, 08:00 AM - 09:30 AM, Holmead East Track: Sustainable Operations

Contributed Session: Sustainable Energy

Chair(s): Gokhan Egilmez

093-1299 Is Sharing More Sustainable? New Product Sales and Transition From Low to High-Product Utilization

David Keith, Assistant Professor, Massachusetts Institute of Technology, United States
Sergey Naumov, Student, Massachusetts Institute of Technology, United States

We explore the effect on new product sales of the transition from low- to high- production utilization in the sharing economy. We show that if product life is defined by use, sales are independent of utilization because products used more intensively wear out more quickly, but with unexpected transitional dynamics.

093-1491 Robust Power Scheduling in Photovoltaic Charging Station

Zihao Jiao, Student, Beijing Institute of Technology, China
Yanzi Zhang, Student, Tsinghua University, China

To explore the photovoltaic (PV) charging station environmental and operational contributions to the main power grid, we propose a distributed robust scheduling model where charging service is assumed to follow an M/G/v shared processor charging system. A case study in Amsterdam is conducted for verifying efficient PV operations.

093-1815 Consistent Allocation of Emission Responsibility in Energy Supply Chains

Sanjith Gopalakrishnan, Student, University of British Columbia, Canada
Daniel Granot, Professor, University of British Columbia, Canada
Frieda Granot, Professor, University of British Columbia, Canada

Motivated by a recent Canadian regulation to factor in upstream emissions during environmental impact assessment of energy projects, we adopt a cooperative game model and derive the nucleolus as a consistent mechanism to apportion upstream emission responsibility in energy supply chains. We develop algorithmic results and provide an implementation framework.

093-2323 Renewable and Nonrenewable Energy Use Analysis of the U.S. Manufacturing: A Time-Series MRIO Approach

Bahadir Ezici, Student, University of New Haven, United States
Gokhan Egilmez, Assistant Professor, University of New Haven, United States
Ridvan Gedik, Assistant Professor, University of New Haven, United States

In this study, U.S. manufacturing industries' domestic and global supply chain-linked economic and energy use are investigated. Multi-Region Input Output (MRIO) models were built. A 20-year study period was determined based on data availability. Results are compared in terms of the change manufacturing industries' dependency on renewable and nonrenewable energy.

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Saturday, 08:00 AM - 09:30 AM, Holmead West Track: Finance and Operations Management

Invited Session: Topics in OM-Finance Interface

Chair(s): S. Alex Yang Christopher Chen

093-0258 Mitigating Product Shortages Due to Disruptions in Multi-Stage Supply Chains

Florian Lucker, Assistant Professor, Cass Business School, United Kingdom
Sunil Chopra, Professor, Kellogg School of Management, United States
Ralf Seifert, Professor, Epfl, Switzerland

We study multi-stage serial supply chains subject to disruptions. We show that it is often optimal to hold more risk mitigation inventory downstream than upstream (despite the higher costs). Likewise, it is often optimal to hold more reserve capacity downstream than upstream.

093-0605 Crowdfunding Under Social Learning and Network Externalities

Fasheng Xu, Student, Washington University St Louis, United States
Fuqiang Zhang, Professor, Washington University St Louis, United States

In rewards-based crowdfunding, a firm (campaigner) pre-sells a new product and solicits financial contributions from the crowd (consumers) to cover production costs. This paper investigates how the presence of both social learning and network externalities affect the strategic interaction between a crowdfunding firm and forward-looking consumers.

093-0728 Global Supply Chains and Cross-Border Financing

Jie Peng, Student, City University of Hong Kong, Hong Kong
Jing Wu, Assistant Professor, City University of Hong Kong, Hong Kong
Yu Zhang, Assistant Professor, Peking University, China

In this study, we find global supply chain relationships help firms access cross-border financing in the international capital markets. This result is supported empirically by all major financing vehicles, including stock cross-listing, bond issuance, bank loans, and M&A deals, and is robust in controlling strategic disclosure concerns.

093-0991 Information Asymmetry, Rents, and Price Risk Allocation: An Investigation of the BMW Supply Chain

Danko Turcic, Associate Professor, Washington University St Louis, United States
Panos Markou, Post Doc/Researcher, Cambridge University, United Kingdom
Panos Kouvelis, Professor, Washington University St Louis, United States
Daniel Corsten, Professor, IE BUSINESS SCHOOL, Spain

Contracts help shift price risk between supply chain partners. However, by nature of being further downstream, firms often cannot verify prices that suppliers report. We first theorize about a firm's equilibrium, contract choice, and then test predictions empirically using a proprietary data set provided by BMW.

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Saturday, 08:00 AM - 09:30 AM, Gunston East Track: Purchasing and Supplier Management

Invited Session: Tutorial: Ethics in purchasing

Chair(s): Xenophon Koufteros Xingzhi Jia

093-2416 Ethics in Purchasing

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

In this tutorial, Xenophon Koufteros presents various challenges and best practices of research on ethics in purchasing. Findings from studies in the US, China, Italy, Spain, Finland and other countries in Europe, Asia, Africa, and Latin America will discuss innovative methodological approaches.

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Saturday, 08:00 AM - 09:30 AM, Gunston West Track: Next Generation Operations

Invited Session: Alternative Energy and Other Disruptive Energy Technologies

Chair(s): Nur Sunar

093-0279 Shared Autonomous Electric Vehicles for Strengthening Future Urban Microgrids

Mengyi Sha, Student, Chinese Academy of Sciences, China
Wei Qi, Assistant Professor, Mcgill University, Canada
Shanling Li, Professor, Mcgill University, Canada

We envision the prospect where shared autonomous electric vehicles (SAEVs) will reinforce future urban electricity infrastructure in the form of solar-powered microgrids. We integrate cross-disciplinary modelling of transport and power systems with optimization to investigate the potential of SAEVs for improving the self-sufficiency and resilience of urban microgrids.

093-1498 Mind the Gap: Coordinating Energy Efficiency and Demand Response

Eric Webb, Assistant Professor, University of Cincinnati, United States
Owen Wu, Associate Professor, Indiana University, United States
Kyle Cattani, Associate Professor, Indiana University Bloomington, United States

Energy efficiency programs and demand response programs, two popular approaches to energy demand-side management, traditionally are designed and evaluated independently. Breaking with this tradition, we examine the interactions between long-term energy efficiency upgrades and daily demand response participation at an industrial firm.

093-1758 Net-Metered Distributed Renewable Energy: A Peril for Utilities?

Nur Sunar, Assistant Professor, Kenan-Flagler Business School, United States
Jayashankar Swaminathan, Professor, University of North Carolina Chapel Hill, United States

This paper studies the implications of distributed renewable energy (e.g., residential solar) for utility profits and social welfare under the net metering policy. We show that the presence of net-metered distributed renewable energy can result in a strictly larger expected profit for utilities when wholesale market dynamics are factored in.

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Saturday, 08:00 AM - 09:30 AM, Fairchild East Track: POM in Practice

Invited Session: Alliance, contracting and inventory transshipment

Chair(s): Yue Dai Xiaole Wu

093-2139 Alliance Formation Among Competitors

Xiaole Wu, Assistant Professor, Fudan University, China
Derui Wang, Student, Fudan University, China
Yue Dai, Professor, Fudan University, China
Christopher Tang, Professor, University of California Los Angeles, United States

We study potential alliance formation among three firms with asymmetric capacity. The big firm is not capacity constrained, but the two small firms have limited capacity. Each firm has loyal buyers and tries to capture the demand from switchers. Because of antitrust, we derive equilibrium alliances of two firms.

093-0801 Inventory Transshipment Game with Limited Supply: Trap or Treat

Ziteng Wang, Assistant Professor, Northern Illinois University, United States
Yue Dai, Professor, Fudan University, China
Shu-Cherng Fang, Professor, North Carolina State University, United States

We investigate a two-newsvendor inventory transshipment game with limited supply. Nash equilibrium of orders exists only under certain conditions. Compared with a no-transshipment scenario, a newsvendor may be worse off. Numerical studies indicate that transshipment price plays an important role in this phenomenon. A coordinating mechanism is designed for price negotiation.

093-0265 Managing Multi-Rooming: Why Uniform Price is Uniformly Lower

Yue Dai, Professor, Fudan University, China

We derive and compare the firm's prices and profits under the uniform and the dual pricing. An important finding is that the uniform pricing can outperform the dual pricing even with a price lower than both the online and offline prices which is very beneficial to the firm.

093-1942 Supply Chain Contracts for Biopharmaceutical Projects

Yasemin Limon, Student, University of Wisconsin Madison, United States
Tugce Martagan, Assistant Professor, Technische Universiteit Eindhoven, Netherlands
Ananth Krishnamurthy, Professor, University of Wisconsin-madison, United States

Biopharmaceutical R&D projects require multiple steps that involve high uncertainty and costs. Large biopharmaceutical companies may subcontract some of these steps to one or more small contract biomanufacturers to reduce risk and costs. We compare the performance of various contract designs for this supply chain.

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Saturday, 08:00 AM - 09:30 AM, Fairchild West Track: Economics Models in Operations Management

Invited Session: Multi-Channel Management

Chair(s): Kejia Hu Yixin Iris Wang

093-1045 Using Transparency to Manage the Sourcing of Complex Non-Routinized Services

Jacob Chestnut, Assistant Professor, Cornell University, United States
Damian Beil, Professor, University of Michigan, United States

Complex services (non-routine litigation) are often billed hourly, making it difficult for buyers and suppliers to identify/remove inefficient work. Instead, suppliers may truncate their bill to provide value. We consider an alternate mechanism: both parties proactively collaborate using detailed transparency about the buyer's requirements and the supplier's planned/completed processes.

093-1158 Managing Queues with Static Delivery Guarantees

Mehdi Hosseinabadi Farahani, Student, University of Texas Dallas, United States
Milind Dawande, Professor, University of Texas Dallas, United States
Ganesh Janakiraman, Professor, University of Texas Dallas, United States

We study the problem of managing queues in online food ordering services where customers are promised a common due-date lead time. The objective is to minimize the total earliness and tardiness costs incurred by the customers. Our results show that a threshold policy yields near-optimal solutions.

093-1184 Adoption and Abandonment: A Payment Channel Under Impacts of Price Incentives and Usage Features

Shuai Ling, Assistant Professor, Tianjin University, China
Shoufeng Ma, Professor, Tianjin University, China
Kejia Hu, Assistant Professor, Vanderbilt University, United States
Ning Jia, Professor, Tianjin University, China

Our research is to evaluate the introduction of various payment channels; particularly to understand how monetary incentives and features of the payment channel alter consumers' habitual behavior. The research uses 4-year transaction data including three payment methods: contactless smart card, debit card, and mobile payment.

093-0189 Drivers and Implications of Direct-Store-Delivery in Distribution Channels

Mumin Kurtulus, Associate Professor, Vanderbilt University, United States
Canan Savaskan-Ebert, Associate Professor, Southern Methodist University, United States
Chunlin Wang, Assistant Professor, Davis College of Business and Economics, United States

We consider a distribution channel where two competing manufacturers sell their products to the consumers via a single shelf-space constrained retailer. We compare a conventional channel where the retailer is responsible for replenishments to a DSD channel where the retailer relies on the manufacturers to replenish the shelf-space.

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Saturday, 08:00 AM - 09:30 AM, Embassy Track: Environmental Operations Management

Contributed Session: Applied Optimization for Environmental OM

Chair(s): Nilakantan Narasinganallur

093-1062 Supplier Selection Model for End-of-Life Product Recovery: An Industry 4.0 Perspective

Ozden Tozanli, Student, University of Bridgeport, United States

Elif Kongar, Professor, University of Bridgeport, United States
Gazi Duman, Student, University of Bridgeport, United States

Today's competitive market dynamics inevitably lead to changes in current business structures, requiring organizations to realign their long-term business strategies to accommodate technological innovations. Delineating the value of Industry 4.0 integration into the supplier selection problem, this study presents a goal programming (GP) model for product recovery operations.

093-2108 Detection and Control Operations Management of an Agricultural Invader Through Integrated Simulation-Optimization

Sevilay Onal, Student, New Jersey Inst of Technology, United States
Esra Buyuktahtakin Toy, Associate Professor, New Jersey Institute of Technology, United States
Jennifer Smith, Associate Professor, Wichita State University, United States
Gregory Houseman, Associate Professor, Wichita State University, United States

An aggressive invasive plant, Sericea, threatens biodiversity causing large economic damage in the Great Plains of the U.S. Using an integrated simulation-optimization model, we study trade-offs between detecting new random pop-outs and treating older already-detected patches. The model is calibrated using 3-year data collected in Kansas and Oklahoma.

093-2285 Sharing Economy: Recent Trends and Issues in India

Nilakantan Narasinganallur, Associate Professor, KJ SIMSR, India
Kingsley Gnanendran, Professor, University of Scranton, United States

This paper's focus is on recent trends and issues of the sharing economy in India in the context of digitalization and technological advancement. We review the developments in the unorganized and private sectors of the sharing economy and cover problems faced by small businesses and policy actions from government authorities.

093-2292 Quantitative Modeling Applications in the Indian Paper Industry

Nilakantan Narasinganallur, Associate Professor, KJ SIMSR, India
Ravindra Baliga, Assistant Professor, K.J Somaiya Institute of Management Studies & Research, India

We look at two models for sustainable paper-making viz. optimization modeling with environment costs and cutting stock model with automatic pattern generation. The industry is well established and poised for implementing the applications and efforts to engage with Indian paper manufacturers to adopt quantitative models.

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Saturday, 08:00 AM - 09:30 AM, Du Pont Track: Revenue Management and Pricing

Invited Session: New Topics in Revenue Management

Chair(s): Yao Cui Junhyun Bae

093-0757 Platform Bonus Competition in the Gig Economy

XIAOYAN LIU, Student, Cornell University, United States
Yao Cui, Assistant Professor, Cornell University, United States
Li Chen, Associate Professor, Cornell University, United States

Service platforms in the gig economy have been commonly offering independent providers bonuses contingent on the frequency of provider participation. We find that platform competition intensity is a key driver for platforms to offer bonuses. Moreover, platforms coordinating on bonus design can restore sustainability to platforms without harming social welfare.

093-1162 Optimal Fashionability for Seasonal Products

Arian Aflaki, Assistant Professor, Joseph M. Katz Graduate School of Busine, United States
Robert Swinney, Associate Professor, Duke University Durham, United States

We study the joint design, pricing, and inventory decisions of firms facing consumers that have low valuations for products that are out of style and rapidly lose value. We illustrate that firms that implement dynamic pricing should carefully consider the interdependence between their inventory and design decisions.

093-2449 Incentive Design for Operations-Marketing Multi-Tasking

Tinglong Dai, Associate Professor, Johns Hopkins University, United States
Rongzhu Ke, Assistant Professor, Hongkong Baptist University, Hong Kong
Christopher Ryan, Associate Professor, University of Chicago, United States

A firm hires a store manager to make operational and marketing efforts. The outputs -- demand and capacity -- face demand censoring. We show the optimal compensation plan is a base salary with bonus paid when a minimum level of inventory is sold out, or sales meets an inventory-dependent target.

093-1550 The Effect of Capacity Risk on Price Competition with Customer Switching Cost

Junhyun Bae, Student, Cornell University, United States
Li Chen, Associate Professor, Cornell University, United States
Yao Cui, Assistant Professor, Cornell University, United States

We consider price competition between online retailers who face capacity risk of fulfilling orders in a market with consumer switching costs. We find that capacity risk mitigates price competition and the ability to price based on capacity realization leads to different implications for firms with high/low capacity risk.

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Saturday, 08:00 AM - 09:30 AM, Cardozo Track: Data Science

Contributed Session: Data Analytics in Action

Chair(s): Raymond Major

093-0775 Success Factors for Big Data Analytics in Manufacturing

Christoph Wunck, Professor, Emden/Leer University, Germany

The big data wave in the manufacturing industries presents many challenges for manufacturers. Production managers are encouraged to equip their machines with sensors and start acquiring data from their processes. This talk focuses on some prerequisites necessary for data mining and complex event processing technologies to deliver on their promises.

093-2264 Unsupervised Learning for Cybersecurity Management of Internet of Things Systems

Honggang Wang, Professor, ????, United States

IoT systems connect machines, humans, and service infrastructures with smart devices and computer networks. The cyber connection brings more security concerns particular for critical industrial or service systems. We develop new cybersecurity anomaly detection algorithms based on unsupervised learning and demonstrate the effectiveness using a water treatment plant case.

093-2197 STEM 2.0

Raymond Major, Associate Professor, Virginia Tech, United States
Roberta Russell, Professor, Virginia Polytechnic Institute And State University, United States

The jobs are there, well- paying, too. So why aren't more students in STEM majors? STEM 2.0 and the balancing act between data and purpose. We'll take a look at what can make STEM more attractive and if it will work.

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Saturday, 08:00 AM - 09:30 AM, Coats — Track: Social Media and Internet of Things

Invited Session: Social Media and Analytics

Chair(s): Abhijeet Ghoshal

093-0618 A Framework for Analyzing Influencer Marketing in Social Networks: Selection and Scheduling of Influencers

Rakesh Mallipeddi, Student, Texas A&M University College Station, United States
Subodha Kumar, Professor, Temple University, United States
Chelliah Sriskandarajah, Professor, Texas A&M University College Station, United States
Yunxia Zhu, Assistant Professor, University of Nebraska Lincoln, United States

Influencer marketing, which involves employing influential users of social media, is being increasingly employed by organizations to market/advertise their products. In this study, we propose an optimization framework for selection and scheduling of influencers to maximize the reach and effect of an advertisement.

093-1098 No One Trusts Emotional Women? Measuring the Impact of Discrete Emotions on Review Helpfulness

Zhe Shan, Assistant Professor, Miami University, United States
Wenqi Zhou, Assistant Professor, Duquesne University, United States
Georgiana Craciun, Assistant Professor, Duquesne University, United States

We examine the differential helpfulness of emotional WOM from female and male reviewers and test the moderating effects of contextual emotion. Two studies on three discreet emotions (happiness, anger, and anxiety) provide evidence for the influence of gender stereotypes on helpfulness ratings. Such gender stereotype effects vary among different emotions.

093-1590 Studying Quantity Discount and Market Share Contracts Under Congestion

Sumanta Singha, Assistant Professor, Indian School of Business, India
Rajib Saha, Assistant Professor, Indian School of Business, India
Subodha Kumar, Professor, Temple University, United States

Unlike in quantity discount contracts, discounts can be based on the share of demand the buyer allocates to the seller; typically known as market share contracts. We study and compare the optimal decisions of a strategic vendor facing congestion and price sensitivity under both types of contracts.

093-1063 Hiding Sensitive Information When Sharing Distributed Transactional Data

Abhijeet Ghoshal, Assistant Professor, University of Wisconsin-Milwaukee, United States
Syam Menon, Associate Professor, University of Texas Dallas, United States
Sumit Sarkar, Professor, University of Texas Dallas, United States

We propose a method to hide senstive itemsets before sharing transactional data with business partners when the dataset exists in a distributed format, and itemsets are senstive at both local and full dataset levels.

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Saturday, 08:00 AM - 09:30 AM, Columbia 1 — Track: Scheduling and Logistics

Invited Session: Project Scheduling: Models, Methods, and Applications

Chair(s): Norbert Trautmann

093-1138 The Role of Robustness in Ineventory vs Timeliness Tradeoff in Project Delivery

Arman Jabbari, Student, University of California Berkeley, United States
Phil Kaminsky, Professor, University of California Berkeley, United States

We explore the tradeoffs between inventory holding costs and project completion times in a variety of settings, across single and multiple projects, and we analyze how robustness affects these tradeoffs.

093-1582 Scheduling the Timing of Product Introductions in the Automotive Industry

Rainer Kolisch, Professor, Technische Universitat Munchen, Germany
Christopher Bersch, Student, Technische Universitat Munchen, Germany

Renzo Akkerman, Associate Professor, Wageningen University, Netherlands

We are considering the scheduling of the start and end of production of car variants in order to optimize multiple criteria. We model the problem as MIP and present computational results as well as managerial insights using data from a major German automobile manufacturer.

093-1789 Use of Quality Functions in Project Scheduling in the Presence of Uncertainty

Bruce Pollack-Johnson, Associate Professor, Villanova University, United States
Matthew Liberatore, Professor, Villanova University, United States

In this paper, we use continuous quality functions, with quality as a nonlinear function of time and cost, to analyze trade-offs between time, cost, and quality in project scheduling in the presence of uncertainty. We show results using data from two real-life examples, utilizing stochastic programming, and simulation.

093-1996 Actual Running Time Variability in a Rural Transit System

Roger Solano, Professor, Slippery Rock University - School of Business, United States
Liang Xu, Associate Professor, Slippery Rock University - School of Business, United States

Automatic Vehicle Location data from a rural transit route and weather data are used to identify variability in actual running time. We analyze the adequacy of scheduled running times and scheduled recovery times. We also analyze sources of variability in the actual running times and make recommendations

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093-1110 An MILP Formulation for the Multi-Mode Resource-Constrained Project Scheduling Problem MRCPSP

Norbert Trautmann, Professor, University of Bern, Switzerland
Mario Gnägi, Student, University of Bern, Switzerland

We propose a novel MILP formulation for the MRCPSP based on variables representing the assignment of the project activities to individual resource units and the sequential relationships between activities that are assigned to at least one identical resource unit. The model exhibits advantageous performance for instances with long activity durations.

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Saturday, 08:00 AM - 09:30 AM, Columbia 2 Track: Operational Excellence

Invited Session: Digital lean manufacturing

Chair(s): Matthias Thurer

093-2194 Small Businesses Find a Way

Barbara Hoopes, Associate Professor, Virginia Tech, United States
Roberta Russell, Professor, Virginia Polytechnic Institute And State University, United States

Work arounds, continuous improvements and innovations - small businesses find a way to survive. Stories from the front lines of the foundation of our economy and the heart of our communities.

093-1432 Exploring the Relationship Between Lean Project Management and Organizational Learning for Operational Success

Jane Dowson, Post Doc/Researcher, Liverpool John Moores University, United Kingdom
David Bryde, Professor, ????, United Kingdom
Christine Unterhitzenberger, Lecturer, Liverpool John Moores University, United Kingdom

Linking Lean Project Management and Organizational Learning offers a unique opportunity to discover how clusters of best practice can develop and emerge over time. We provide new insights into the utility and impact of this relationship as a viable change initiative to improve operational capacity, organizational capability, and success.

093-0568 Impact of Integrated Lean Manufacturing and Industry 4.0 Practices on Operational Performance

Sven Margraf, Student, Cardiff University, Germany
Maneesh Kumar, Professor, Cardiff University, United Kingdom
Andrea Chiarini, Managing Director, Chiarini & Associati, Italy

Industry 4.0 (I4.0) encompasses a variety of technologies that are deemed to revolutionize Lean Manufacturing (LM). This paper investigates the operational performance impact of integrating hard LM practices and I4.0 technologies in the manufacturing industry. The findings indicate that low integration levels can already result in considerable operational performance improvements.

093-0155 Management Cybernetics: What can Industry 4.0 Learn from Card-Based Control Systems?

Matthias Thurer, Professor, Jinan University, China

Industry 4.0 relies on self-organized logistics, self-optimizing machines, etc. This challenges research often focused on analytical problems that prohibit feedback loops. Kanban is a cybernetic control system based on feedback loops. It is argued that it provides important insights into how to structure communication in the context of Industry 4.0.

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Saturday, 08:00 AM - 09:30 AM, Columbia 3 Track: Healthcare Analytics

Contributed Session: Personalized Treatment and Care Delivery

Chair(s): Mark Van Oyen

093-2322 Dynamic Online Learning of Personalized Patient Progression in Chronic Diseases: Application to Glaucoma

Esmaeil Keyvanshokooh, Student, Industrial and Operations Engineering Department, United States
Mark Van Oyen, Professor, University of Michigan, United States
Mariel Lavieri, Assistant Professor, University of Michigan - Ann Arbor, United States
Christopher Andrews, Post Doc/Researcher, University of Michigan - Ann Arbor, United States
Joshua Stein, Assistant Professor, University of Michigan - Ann Arbor, United States

We develop new online learning algorithms for learning personalized patient progression in chronic diseases to alert clinicians and patients. Our Thompson sampling-based approach can handle large sets of covariates and we are able to incorporate the dynamic nature of disease progression. We identify the progression of Glaucoma.

093-1483 Integrating Physical Activity Information into Insulin Dosing Decisions in Type 1 Diabetes

Basak Ozaslan, Student, University of Virginia, United States
Stephen Patek, Professor, University of Virginia, United States
Marc Breton, Associate Professor, University of Virginia, United States

In Type 1 Diabetes, the body's autonomous glucose control is lost and patients are treated with external insulin injections. Insulin dose for optimum glucose control changes following physical activity. We developed a method that integrates physical activity information, obtained from wearables, into treatment decisions and improves glucose control in these patients.

093-2335 Online Personalized Care Framework to Reduce Readmission Risk

Mohammad Zhalechian, Student, University of Michigan - Ann Arbor, United States
Esmaeil Keyvanshokooh, Student, University of Michigan - Ann Arbor, United States
Mark Van Oyen, Professor, University of Michigan, United States

We present a personalized care framework for allocating higher level of care beds to reduce readmission risk. For online learning, we develop a contextual multi-armed bandit algorithm incorporating a limited number of beds over a finite horizon and provide a finite-time regret analysis and test it with real data.

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Saturday, 08:00 AM - 09:30 AM, Columbia 4 Track: Healthcare Analytics

Invited Session: Patients and Process: Changing Healthcare through Analytics

Chair(s): Jonathan Helm Pengyi Shi

093-0230 Staffing and Scheduling to Differentiate Patient Delays in Emergency Departments

Yunan Liu, Assistant Professor, North Carolina State University, United States
Xu Sun, Student, Columbia University, United States
Kyle Hovey, Student, North Carolina State University, United States

Motivated by the Canadian triage and acuity scale guideline, we devise new time-varying staffing and dynamic scheduling principles in ED to guarantee that level i patients need to be seen by a physician within w_i minutes 100a_i% of the time for any given w_i>0 and 0<a_i<1.

093-1059 A Stochastic Modeling Approach for Planning Resources at Non-Operating Room Procedural Area

Joonyup Eun, Assistant Professor, Korea University, South Korea
Vikram Tiwari, Associate Professor, Vanderbilt University Medical Center, United States
Mitchell Tsai, Associate Professor, University Of Vermont Larner College Of Medicine, United States
Max Breidenstein, Clinical Research Assistant, University Of Vermont Larner College Of Medicine, United States
Warren Sandberg, Professor, Vanderbilt University Medical Center, United States

Uncoordinated service requests and non-proximity of non-operating room sites make staffing decisions for the area challenging. We develop a stochastic model that determines an anesthesiologists' assignment, considering four measures. In most cases, a pareto improvement of the actual assignment is found using the model. We also analyze trade-offs among the measures.

093-1739 A New Value Proposition for Reducing Readmissions: Dynamic Staffing for Post-Discharge Follow-up

Jonathan Helm, Assistant Professor, Kelley School of Business, United States
Alex Mills, Associate Professor, Baruch College, United States
Shanshan Hu, Assistant Professor, Indiana University Bloomington, United States
Sean Yu, Student, Indiana University, United States
Julian Pan, CEO, Lean Care Solutions Corp, United States

Post-discharge follow-up appointments for moderate-risk patients may not be cost-effective when capacity is planned naively. We use a dynamic programming model to show that such follow-up appointments can be scheduled cost-effectively and we demonstrate the potential cost savings.

093-1891 Improving Itinerary Completion at a Destination Healthcare Institution

Jonathan Helm, Assistant Professor, Kelley School of Business, United States
David Kaufman, Assistant Professor, University of Michigan-Dearborn, United States
Pengyi Shi, Assistant Professor, Purdue University, United States
Mark Van Oyen, Professor, University of Michigan, United States

At destination hospitals, patients travel long distances to receive treatment. For these patients, itinerary completion is an important metric. We present a new methodology for modeling and optimizing flows in a queueing network of outpatient clinic visits to minimize flow times of priority patients with hard deadlines for service completion.

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Saturday, 08:00 AM - 09:30 AM, Columbia 5 Track: Healthcare Operations Management

Invited Session: Incentives and Process Improvement in Healthcare

Chair(s): Lu Wang Suman Mallik

093-1766 Medicare Payment to Skilled Nursing Facilities: The Consequences of the Three-Day Rule

Feng (Susan) Lu, Associate Professor, Purdue University, United States

Medicare does not pay for the fee-for-service care provided in a skilled nursing facility (SNF) unless the patient has stayed in the hospital for at least three days. We study how this three-day rule affects inpatient discharge to SNFs and the subsequent 30-and 60-day hospital readmission rates.

093-1829 Managing Medical Item Inventories Under Order Loss

Ozden Cakici, Assistant Professor, American University, United States

In hospitals, order information for medical items go through multiple departments before being submitted to a medical supplier. At times, order information is inadvertently lost on the way, leading to order-loss. Using our case study at MRI units, we propose a periodic review policy and two technology features to mitigate/eliminate order-loss.

093-1321 The Impact of Full Capacity Protocol on the Operational Performance of an Emergency Department

Lu Wang, Student, University of Kansas, United States
Mazhar Arikan, Associate Professor, University of Kansas, United States
Suman Mallik, Associate Professor, University of Kansas, United States

The Full Capacity Protocol (FCP) is a set of guidelines that coordinate the patients flow when the emergency department (ED) is overcrowded. Utilizing data from a large urban teaching hospital, we characterize its impacts on the operational performance of the ED.

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Saturday, 08:00 AM - 09:30 AM, Columbia 6 Track: Healthcare Operations Management

Invited Session: Contracting and Payment Innovations in Healthcare

Chair(s): Mili Mehrotra

093-1249 Socially Optimal Contracting Between a Regional Blood Bank and Hospitals

Anand Paul, Associate Professor, University of Florida, United States
Tharanga Rajapakshe, Assistant Professor, University of Florida, United States
Suman Mallik, Associate Professor, University of Kansas, United States

Motivated by the operational challenges faced by a Regional Blood Bank (RBB) in distributing the blood (and related products) among the hospitals in its service area, we study socially optimal contracting decisions of an RBB serving multiple hospitals.

093-1472 Financial Incentives Under CPC+

Elodie Adida, Associate Professor, University of California Riverside, United States
Fernanda Bravo, Assistant Professor, UCLA Anderson School of Management, United States

CMS launched the Comprehensive Primary Care Plus (CPC+) payment initiative, aiming at improving primary care delivery. Under CPC+, physicians are encouraged to use alternative care delivery methods (phone calls, e-visit, in-home nurse visits). We study how CPC+ impacts providers' care delivery decisions, patient welfare, and payer cost.

093-1509 Reference Pricing for Healthcare Services

Shima Nassiri, Assistant Professor, University of Michigan - Ann Arbor, United States
Elodie Adida, Associate Professor, University of California Riverside, United States
Hamed Mamani, Associate Professor, University of Washington, United States

The traditional healthcare payment system does not incentivize hospitals to limit their prices. Reference pricing (RP) has been proposed as a way to better align incentives. Under RP, patients may be responsible for part of the cost. We propose a model to analyze RP.

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Saturday, 08:00 AM - 09:30 AM, Columbia 7 Track: Supply Chain Management

Invited Session: Empirical Sourcing Research

Chair(s): Keith Skowronski

093-0276 Are Disruptive Technologies Disrupting the Global Sourcing of Business Services?

Devashish Thakar, Student, University of South Carolina, United States
Sean Handley, Associate Professor, University of South Carolina, United States
Keith Skowronski, Assistant Professor, University of South Carolina, United States

The role of organizational experience in the vendor selection process has received insufficient attention in the sourcing literature. This study addresses this gap by examining the relationship between experience and vendor selection in the context of business services outsourcing. The moderating influence of disruptive technologies on this relationship is examined.

093-0639 Top Management Teams and Sustainability Performance: The Role of Temporal Orientation

Stephanie Eckerd, Assistant Professor, Indiana University Indianapolis, United States
Saif Mir, Assistant Professor, College of Charleston, United States
John-Patrick Paraskevas, Assistant Professor, Miami University, United States

Top management dictates organizational temporal orientation in strategic priorities and resource allocations. Temporal considerations are critical to sustainability issues as there are often time lags until their impact is realized. We evaluate the link between the functional composition of top management and organizational temporal orientation and impacts on sustainability performance.

093-1143 The Strategic Alignment Saga - Does Supply Chain Have to Be Aligned to Firm Strategy?

Piyush Shah, Student, Arizona State University, United States
Thomas Kull, Associate Professor, Arizona State University Tempe, United States

It is believed that under high (low) environmental uncertainty a combination of differentiation (cost focus) based firm strategy and responsive (efficient) supply chains yields high performance. In this paper, we empirically test this belief using secondary financial data. The results of polynomial regression do not support the traditional beliefs.

093-1485 The Effect of Supply Base Characteristics on Product Recalls

Yan Dong, Professor, University of South Carolina, United States

Sining Song, Assistant Professor, University of Tennessee Knoxville, United States
Fan Zou, Student, University of South Carolina, United States

In this study, we use a unique data set to examine the role of characteristics of the supply base in product recalls. We find different effects of supply base characteristics.

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Saturday, 08:00 AM - 09:30 AM, Columbia 8 Track: Supply Chain Management

Invited Session: Emerging Topics in Supply Chains

Chair(s): Haresh Gurnani Saibal Ray

093-0851 Peer-to-Peer Sharing Platforms with Quality Differentiation: Manufacturer's Strategic Decision Under Sharing Economy

Huiqi Guan, Assistant Professor, Fudan University, China
Xin Geng, Assistant Professor, University of Miami, United States
Haresh Gurnani, Professor, Wake Forest University, United States

We formulate a multi-stage game-theoretic model to analyze the manufacturer's strategic move of building an exclusive product sharing platform to respond to the competition from the emerging peer-to-peer product sharing platforms in the downstream market. Our results indicate that a high-quality manufacturer can benefit from building a peer-to-peer sharing platform.

093-1111 Service Provision in Distribution Channels

Haresh Gurnani, Professor, Wake Forest University, United States
Shubhranshu Singh, Assistant Professor, Johns Hopkins University, United States
Sammi Tang, Associate Professor, University of Miami, United States
Huaqing Wang, Assistant Professor, Emporia State University, United States

This paper studies a manufacturer's and a retailer's incentive to invest in pre-sales service effort that reduces the consumers' likelihood of seeking after -sales support for an inherently complex information-intensive product. The paper also examines the possibility of collaboration in which the manufacturer shares the retailer's cost of providing pre-sales service.

093-1262 Multi-Period Sourcing Decision Under Disruption Risks and Carbon Emission

Purushottam Meena, Associate Professor, New York Institute of Technology, United States
Shaya Sheikh, Assistant Professor, New York Institute of Technology, United States
Gopal Kumar, Assistant Professor, iim raipur, India

The paper aims to formulate mixed integer nonlinear programming optimization models to solve the problems of multi-period sourcing decisions considering carbon emission regulations and disruptions risk. We solved the problem using CLPEX method and have drawn several managerial insights.

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Saturday, 08:00 AM - 09:30 AM, Columbia 9 Track: Behavioral Operations Management

Invited Session: Behavioral Operations Management

Chair(s): Xiaobo Zhao Wanshan Zhu

093-1207 An Analysis of Empirical Newsvendor Decisions

Anna-Lena Sachs, Assistant Professor, University of Cologne, Germany
Michael Becker-Peth, Assistant Professor, Rotterdam School of Management, Netherlands
Stefan Minner, Professor, Technische Universitat Munchen, Germany
Ulrich Thonemann, Professor, University of Cologne, Germany

We analyze the ordering decisions of a manufacturer who faces a multi-product newsvendor problem with an aggregate service level constraint. The manufacturer broadly exhibits the same biases as subjects do in the laboratory and is prone to another bias that has not been identified before, that is, group aggregation.

093-2164 The Effect of Preference on the Biased Perception of Randomness

Tim De Bree, Student, Erasmus University Rotterdam, Netherlands
Georg Granic, Assistant Professor, Erasmus University Rotterdam, Netherlands
Qingxia Kong, Assistant Professor, Erasmus University Rotterdam, Netherlands

The gambler's fallacy is an erroneous belief in the negative correlations of independent outcomes generated by a random process. In a set of lottery games we found and thus hypothesized that there are less gambler's fallacy betting behavior among preferred options. We test the hypothesis via experimental studies.

093-2201 The Influence of Response Time in Supply Chain Bargaining

Thomas Vogt, Student, University of Cologne, Germany
Fadong Chen, Assistant Professor, Zhejiang University, China
Yingshuai Zhao, Assistant Professor, University of Cologne, Germany

The interaction in a supply-chain bargaining process produces a rich set of information including proposals, responses, and response time (RT). Most of the existing studies ignore the RT information, while recent studies in economics have shown that RT can reveal hidden information. This project is to fill the gap.

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Saturday, 08:00 AM - 09:30 AM, Columbia 10 Track: Product Innovation and Technology Management

Invited Session: Managing Innovation and New Product Development

Chair(s): Morvarid Rahmani

093-1481 Knowledge Transfer From a Radical New Product Development Process to an Existing Product

Wenli Xiao, Assistant Professor, University of San Diego, United States
Cheryl Gaimon, Professor, Georgia Institute of Technology, United States

To alleviate the challenges of successfully developing a radical new product, a firm may choose to transfer a portion of the radical product knowledge to improve an existing product in portfolio. We introduce a dynamic model and provide conditions that drive a firm to undertake such knowledge transfer.

093-0760 Principal's Signaling of Private Information When Outsourcing its Product Development

Chunlin Wang, Assistant Professor, Davis College of Business and Economics, United States
Glen Schmidt, Professor, University of Utah, United States
Bo Van Der Rhee, Professor, Nyenrode University, Netherlands

When a new product development project is outsourced (to an agent) by a principal with inside information, the principal might want to signal this information to the agent. In a stage-gate setting, we compare the performances of contracts that allow various combinations of money transfers (signals).

093-0447 Start-Up Infrastructure and Product Development: An In-Depth Case Study

Berke Guzelsu, Student, Boston University, United States
Nitin Joglekar, Associate Professor, Questrom School of Business, United States

Developing a viable business plan after identifying a potential product is challenging for many start-ups. Using grounded theory building, we investigate the development of a start-up in the hobby games industry through the pre-release of their second product to understand start-up organizational infrastructure development and product development under start-up conditions.

093-1278 Team Size and Coordination in Knowledge-Intensive Projects

Morvarid Rahmani, Assistant Professor, Georgia Institute of Technology, United States

Many knowledge-intensive projects involve a group of team members who jointly work on the project. We study the trade-off between team members' workload and need for coordination, and generate insights on the optimal team size and team structure.

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Saturday, 08:00 AM - 09:30 AM, Columbia 11 Track: Inventory Management

Invited Session: Advances in Stochastic Inventory Theory

Chair(s): Alexandar Angelus

093-0166 Integrating Dynamic Pricing with Inventory Decisions Under Lost Sales

Qi Feng, Professor, Purdue University, United States
Sirong Luo, Associate Professor, Shanghai Univ. of Finance and Economics, China
George Shanthikumar, Professor, Purdue University, United States

Inventory-based pricing under lost sales is an important, yet notoriously challenging problem in the operations management literature. By refining to a class of intuitively appealing policies and applying the properties of stochastic functions, we propose a solution that yields close-to-optimal performance under very general conditions.

093-0964 A Deterministic Approximation of Inventory Systems with Sequential Probabilistic Service Level Constraints

Lai Wei, Student, University of Michigan - Ann Arbor, United States
Stefanus Jasin, Associate Professor, University of Michigan, United States
Linwei Xin, Assistant Professor, University of Chicago, United States

We consider a lost-sales inventory system with non-stationary demands, lead times, and sequential probabilistic service level constraints, which is notoriously difficult to optimize. We propose a simple base-stock policy, derived from a deterministic approximation of the analogous backorder counterpart, and show it is asymptotically optimal in the high service-level regime.

093-0858 Asymptotic Optimal Policies in Inventory Systems with Lead Time

Ganesh Janakiraman, Professor, University of Texas Dallas, United States
Qi Wu, Assistant Professor, Case Western Reserve University, United States

We study a systematic way of constructing asymptotically optimal policies. We apply it to two inventory problems, one is the lost-sale inventory system with a fixed leadtime; the other is a dual-sourcing problem. We show numerically that the new policies perform well for a wide range of parameters.

093-1181 Business Analytics for Intermodal Capacity Management

Long Gao, Assistant Professor, University of California Riverside, United States

The intermodal industry has long suffered from chronic network imbalance. We develop a unified framework that integrates container repositioning with load acceptance. We demonstrate that our approach can greatly reduce chronic network imbalance and improve operational efficiency.

093-0164 Optimal Control and Value of Reverse Logistics in Supply Chains with Multiple Flows of Product

Alexandar Angelus, Assistant Professor, Texas A&M University College Station, United States
Ozalp Ozer, Professor, 1984, United States

We study reverse logistics in a supply chain where each location can initiate regular, reverse, and expedited orders for product. We identify the structure of the optimal policy for the resulting stochastic, multi-stage inventory model with multiple flows of product. This optimal policy renders the model analytically and numerically tractable.

Saturday, 08:00 AM - 09:30 AM

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Saturday, 08:00 AM - 09:30 AM, Columbia 12 Track: Service Operations

Invited Session: Experiments in Service Organizations

Chair(s): Anita Tucker

093-1568 Increasing Patient Engagement Through Shared Medical Appointments

Nazli Sonmez, Student, London Business School, United Kingdom
Kamalini Ramdas, Professor, London Business School, United Kingdom
Ryan Buell, Associate Professor, Harvard Business School, United States

Through a randomized control trial, we examine the impact of shared medical appointments, in which a group of patients meet with a doctor simultaneously, on patient engagement during the appointment (such as making eye contact, engaging in the proceedings, and asking questions) and after (such as complying with prescribed medications).

093-1422 Identifying Perceived Customer Value for Wellness-Centric Features in Hospitality: Evidence From EEG Signals

Min Kyung Lee, Assistant Professor, Northern Illinois University, United States
Aleda Roth, Professor, Clemson University, United States
Oriana Aragon, Assistant Professor, Clemson University, United States

This paper explores customers' perceived value that is attributable to the presence or absence of wellness-centric offerings in a hotel room. In an experimental design we tested the contribution of wellness-centric offerings in value creation through an electroencephalogram (EEG) laboratory experiment with measured self-report and neural indices of "wanting."

093-0591 Impact of Referral Decision Errors on Patient Outcome: A Case of Observation Unit

Temidayo Adepoju, Student, Questrom Business School, Boston University, United States
Anita Tucker, Associate Professor, Boston University, United States

Physicians face the challenge of deciding whether a patient should be discharged home or admitted to an inpatient-bed from the observation-unit. Erroneous decisions affect patient outcome and lead to capacity problems. Using over 15,000 patient-visits to an observation-unit, we study the impact of inaccurate decisions on readmission and LOS.

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Saturday, 08:00 AM - 09:30 AM, Monroe Track: Humanitarian Operations and Crisis Management

Invited Session: Practice-driven research in humanitarian operations

Chair(s): Andres Jola-Sanchez

093-0218 Role of the Private Sector After Disasters: The Case of Hurricane Harvey

Johanna Amaya Leal, Assistant Professor, Iowa State University, United States
Christopher Faires, Student, Iowa State University, United States

Research shows that diverse groups of the civic society play a major role in disaster response. This paper presents preliminary findings resulting from fieldwork on the role played by the private sector after Hurricane Harvey; one of the largest disasters that impacted the United States in September 2017.

093-0505 Stay Dependent: Relational Strategies to Reduce Funding Uncertainty

Gloria Urrea, Post Doc/Researcher, Indiana University, United States
Sebastian Villa, Assistant Professor, Universidad De Los Andes, Colombia
Eric Quintane, Associate Professor, Universidad De Los Andes, Colombia

Humanitarian organizations can follow two types of strategies to reduce funding uncertainty: a broad strategy by approaching multiple donors or a focused strategy by developing long-term relationships with selected donors. We argue that while both strategies reduce current uncertainty, only a relationally focused strategy reduces future uncertainty, which fosters diversification.

093-1457 The Impact of Administration on Program Spending During Emergency and Development Aid

Telesilla Kotsi, Student, Kelley School of Business, United States
Alfonso Pedraza-Martinez, Associate Professor, Indiana University, United States
Maria Besiou, Professor, Kuehne Logistics University, Germany

This study focuses on resource allocation using ten-year financial data of five country offices of a large humanitarian organization. Treating disasters as exogenous shocks, we examine how past administration spending, which enables the organization to build capacity and deliver services efficiently to beneficiaries, has an impact on current program spending.

093-2310 A Study on the Social Media Network Ecosystem During Different Stages of Disaster

Minoo Modaresnezhad, Assistant Professor, University of North Carolina Wilmington, United States
Saba Pourreza, Assistant Professor, University of North Carolina Wilmington, United States
Manoj Vanajakumari, Associate Professor, University of North Carolina Wilmington, United States

We conduct social media analysis and observe the role of various stakeholders in a disaster ecosystem. We applied service dominant logic to explain how participants in a disaster ecosystem co-create and share information shared across social media networks.

093-2060 Communities in the Crossfire: How Companies Can Do Well By Doing Good

Andres Jola-Sanchez, Assistant Professor, Mays Business School, Texas A&M University, United States
Alfonso Pedraza-Martinez, Associate Professor, Indiana University, United States

We study the operational impact of social investments in war-torn areas. With data from Colombia, we assess firm performance after law compelled oil firms invest in host communities. We find that oil firms' operating margin increased by 23%, social investments improved firms' logistics and relations with communities.

Saturday, 08:00 AM - 09:30 AM

182 Saturday, 08:00 AM - 09:30 AM, Lincoln East — Track: Empirical Research in Operations Management

Invited Session: Practice Based Research

Chair(s): Shardul Phadnis Shardul Phadnis

093-0839 Knowledge Transfer and Industry Impact

David Bamford, Professor, University of Huddersfield, United Kingdom
Iain Reid, Reader, Manchester Metropolitan University, United Kingdom
Paul Forrester, Senior Lecturer, Keele University, United Kingdom
Benjamin Dehe, Reader, University of Huddersfield, United Kingdom
Jim Bamford, Senior Lecturer, University of Huddersfield, United Kingdom

This paper suggests a comparison framework to try to find evidence that impacts knowledge transfer. It examines this by reporting on outputs from 13 case studies across two sectors, manufacturing and healthcare. We propose a framework for use by both industry and funding bodies.

093-0860 Embeddedness and Prices in Buyer-Seller Transactions: Evidence from Pharmaceutical Procurement of a Hospital Chain

Arzi Adbi, Student, INSEAD, Singapore
Chirantan Chatterjee, Associate Professor, Indian Institute of Management Ahmedabad, India
Anant Mishra, Associate Professor, University of Minnesota, United States

This study presents new evidence on the effects of embeddedness (relational, structural, positional, and proximal) on transaction prices in the context of buyer-supplier relationships in a large, emerging market.

093-2239 Cooperative and Localized Investments in Hotel Franchising: Moderating Effects of Franchisee Dependence

Jie Zhang, Assistant Professor, University of Victoria, Canada
Benjamin Lawrence, Associate Professor, Georgia State University, United States
Liwu Hsu, Associate Professor, University of Alabama Huntsville, United States

We theorize and test the main and moderating effects of franchisee dependence on a hotel's profitability considering the allocation of resources in cooperative, localized and online domains. We find that franchisee dependence contributes positively to unit profitability and more importantly moderates the impact of resources allocated in different domains.

093-0797 Dyadic Creation of Supply Chain Scenarios: Behavioral Study with Application to Brexit Scenarios

Shardul Phadnis, Associate Professor, Malaysia Institute for Supply Chain Inno, Malaysia
Nitin Joglekar, Associate Professor, Questrom School of Business, United States

Companies use scenario planning to make strategic decisions under deep uncertainty. When regulatory uncertainty affects multi-national supply chains, as experienced after the Brexit referendum, should companies develop scenarios with their supply chain partners? We proposition pros and cons of dyadic (buyer-supplier) scenario creation, test them experimentally, and illustrate using Brexit scenarios.

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183 Saturday, 08:00 AM - 09:30 AM, Lincoln West — Track: Empirical Research in Operations Management

Invited Session: Empirical Research in Service Ops

Chair(s): Tom Tan

093-0659 Call to Duty: Staffing Flexibility at a Restaurant Chain

Masoud Kamalahmadi, Student, Indiana University, United States
Qiuping Yu, Assistant Professor, Indiana University, United States
Yong-Pin Zhou, Professor, University of Washington, United States

Just-in-time scheduling has become ubiquitous, but controversial in the service industry in recent years. Using a rich dataset from a casual-dinning restaurant chain, we empirically explore how just-in-time scheduling impacts worker productivity and then propose an analytical scheduling model to inform the firm whether and how to use just-in-time scheduling.

093-0866 Curbing the Opioid Crisis: The Value of a Second Opinion in the Primary Care Setting

Katherine Bobroske, Student, Cambridge University, United Kingdom
Michael Freeman, Assistant Professor, INSEAD, Singapore
Stefan Scholtes, Professor, Cambridge University, United Kingdom
Lawrence Huan, Internal Medicine Physician, Cambridge University, United States

For the first time in over 50 years, mortality rates in the US decreased for two consecutive years, largely attributed to an increase in drug overdoses. We find evidence that having an early second opinion may be critical in curbing opioid use at its root: in the primary care office.

093-1172 Predicting Human Discretion and Adjusting Algorithmic Prescriptions: A Large-Scale Field Experiment in Bin Packing

Jiankun Sun, Student, Northwestern University, United States
Dennis Zhang, Assistant Professor, Washington University St Louis, United States
Haoyuan Hu, Technical Specialist, Alibaba Group, China
Jan Van Mieghem, Professor, Northwestern University, United States

In logistics, optimization algorithms are deployed to empower humans, but humans' execution may deviate from algorithmic prescriptions. In a field experiment on two bin-packing algorithms, we show that a human's conformance with algorithm solutions and productivity could be improved by predicting discretionary behavior and adjusting algorithmic prescriptions in an optimization algorithm.

093-0329 Behavioral Drivers of Routing Decisions: Evidence from Restaurant Table Assignment

Tom Tan, Assistant Professor, Southern Methodist University, United States
Bradley Staats, Professor, University of North Carolina Chapel Hill, United States

We analyze granular transaction data to examine how hosts revise a given routing rule when seating customers. After that, we empirically analyze the effect of the dispersion of table assignments on restaurant performance and estimate counter-factual sales' impact of adopting an alternative routing priority.

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Saturday, 08:00 AM - 09:30 AM, Jefferson East — Track: Panels & Meetings

Contributed Session: Emerging Scholars 1

Chair(s): Goker Aydin

093-2433 Emerging Scholars 1

Goker Aydin, Professor, Johns Hopkins University, 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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Saturday, 08:00 AM - 09:30 AM, Georgetown East — Track: Supply Chain Risk Management

Invited Session: Business Model with Social Operations

Chair(s): Guangwen Kong

093-0631 Courteous or Crude? Understanding and Shaping User Behavior in Ride-Hailing

Yunke Mai, Student, Duke University Durham, United States
Bin Hu, Associate Professor, Naveen Jindal School of Management, United States
Yuhao Hu, Student, Duke University Durham, United States
Sasa Pekec, Associate Professor, Duke University Durham, United States
Zilong Zou, Student, Duke University Durham, United States

We adopt an evolutionary game model to investigate player behavior evolution in ride-hailing. We identify sustainable asymptotically stable equilibria and show how the platform could leverage operational tools to optimize its performance. We also show a platform may achieve social optimum by prioritizing high-rating riders in matching.

093-1040 Pricing and Capacity Decisions for Shared Service Systems Under Competition

Wei Gu, Student, University of North Carolina Chapel Hill, United States
H. Sebastian Heese, Professor, North Carolina State University, United States
Eda Kemahlioglu-Ziya, Associate Professor, North Carolina State University, United States
Serhan Ziya, Associate Professor, University of North Carolina Chapel Hill, United States

We consider service systems where customers' utility depends on price as well as their service experience, which in turn depends on how crowded the service environment is and with whom the service environment is shared. We investigate how two such systems make pricing and capacity decisions under competition.

093-2187 Referral and Learning on Social Network: Implications for Inventory

Guangwen Kong, Assistant Professor, University of Minnesota - Twin City, United States

We consider a firm selling differentiated products to customers whose preferences are correlated in a social network. We investigate how the design of referral program and customer learning influence the demand distribution and therefore have an impact on the firm's inventory decision

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Saturday, 08:00 AM - 09:30 AM, Georgetown West — Track: Retail Operations

Invited Session: Service strategies to win omnichannel consumers

Chair(s): Elliot Rabinovich

093-1190 Building a Winning Omnichannel Strategy: Overcoming Managers' Biased Perceptions of What Consumers Prefer

Santiago Gallino, Assistant Professor, The Wharton School, United States
Antonio Moreno, Associate Professor, Harvard University, United States
Robert Rooderkerk, Associate Professor, Rotterdam School of Management, Netherlands

We quantify to what extent managers have biased perceptions of what consumers want from online channels in an omnichannel system. We investigate two strategies to overcome these biases, the use of experts and leveraging the wisdom of crowds. Whereas the former seems hard, the latter shows a lot of promise.

093-2034 Impact of Customer Choice on Omnichannel Network Design

Eva Ponce-Cueto, Associate Professor, Massachusetts Institute of Technology, United States
Adriana Gabor, Associate Professor, United Arab Emirates Univ, Netherlands

This paper discusses the impact customer preferences that delivery channels have on omnichannel distribution strategies. First, we design a survey to better understand consumer preferences in omnichannel. Secondly, we propose a network design model that connects these consumer preferences with different omnichannel distribution strategies.

093-1317 Buy Online, Fulfill From Store - Location Assignment and Order Picking

wen zhu, Student, New Jersey Inst of Technology, United States
Amanda Helminsky, Student, Mechanical & Industrial Engineering, United States
Sanchoy Das, Professor, Mechanical & Industrial Engineering, United States

Fulfilling online orders from store inventory is a growing retail strategy. In the nominal case, orders are picked from shelf inventory, for the advanced case, popular items are stocked in fast picking. Models to assign items to fast picking and schedule pickers to minimize order delays and costs are presented.

093-1055 Assessing the Economic Value of Fulfillment Fees in Omnichannel Retail

Elliot Rabinovich, Professor, Arizona State University Tempe, United States
Rui Sousa, Professor, Universidade Catolica Portuguesa, Portugal
Sungho Park, Associate Professor, Arizona State University Tempe, United States
Sina Golara, Student, Massachusetts Institute of Technology, United States

We draw from a quasi-natural experiment, conducted in partnership with an omnichannel grocery retailer, to examine how eliminating fulfillment fees for "Click & Collect" orders at retail stores, while maintaining fulfillment fees for home delivery is unchanged, affects consumers' shopping activity as well as the retailer's revenue and fulfillment costs.

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Saturday, 08:00 AM - 09:30 AM, Cabinet Track: Sustainable Operations

Invited Session: Empirical Studies in Sustainable Operations (1)

Chair(s): Gokce Esenduran

093-0275 Experiential Effects on Utility Consumption

Amrou Awaysheh, Assistant Professor, Indiana University, United States
Sriram Narayanan, Associate Professor, Michigan State University, United States
Brian Jacobs, Associate Professor, Pepperdine University, United States

Experience curves model the effects of organizational experience on the unit cost of production. We examine the effects of organizational experience on the consumption of utilities required for manufacturing. We consider both direct in-plant experience effects as well as potential cross-learning from related plants and interactions across utility types.

093-1508 An Empirical Study on Supply Chain Governance Strategies in Reducing Carbon Emissions

Herbie Huang, Student, University of North Carolina Chapel Hill, United States
Sriram Narayanan, Associate Professor, Michigan State University, United States
Swaminathan Jay, Professor, University of North Carolina Chapel Hill, United States

We theorize and empirically test the role of supplier base diversity in both industry and geographic locations on the supply chain governance. We evaluate the impact of different governance strategies on reducing carbon emissions.

093-2212 Do Ride-hailing Platforms Lead to Crowding or Pooling?

Suvrat Dhanorkar, Assistant Professor, Penn State University State College, United States

The study examines the effect of Uber's entry on traffic flows under various contextual conditions.

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Saturday, 08:00 AM - 09:30 AM, Intl Ballroom East Track: Supply Chain Analytics

Invited Session: Data Driven Pricing Decisions

Chair(s): Haoying Sun

093-0968 Data-Driven Inventory and Pricing Management with Adversarial Models

Qi Feng, Professor, Purdue University, United States
Chengzhang Li, Student, Purdue University, United States
Mengshi Lu, Assistant Professor, Purdue University, United States

We study the problem of jointly optimizing the price and order quantity of a perishable product to minimize the worst-case regret under demand ambiguity. We characterize the optimal decisions and study the impact of inventory risk on the optimal price. We demonstrate the advantages of our approach over existing ones.

093-1864 An Empirical Study of the Impact of Membership Free Shipping on Consumer's Purchase Behavior

Fangfei Guo, Student, Texas A&M University College Station, United States
Yan Liu, Associate Professor, Texas A&M University College Station, United States

The main purpose of this paper is to examine how a prevalence shipping policy in e-commerce – Membership Free Shipping (MFS), affects various aspects of consumers' purchase behavior and retailer's profit in both the short and long term. The results show that the MFS program is not always profitable.

093-2306 The Impact of Open Source Community on Cryptocurrency Market Price: An Empirical Investigation

Mariia Petryk, Student, University of Florida, United States
Praveen Pathak, Associate Professor, University of Florida, United States
Liangfei Qiu, Assistant Professor, University of Florida, United States

Cryptocurrencies are popular instruments for funding startups. Source code of cryptocurrencies is publicly available on open source platforms and is an important source of information for investors. We study how different types of project development activities influence the price of cryptocurrency, and investigate actions which bring the highest price impact.

093-2274 Estimating Demand Stickiness Due to Rational Inattention

Haipeng (Allan) Chen, Professor, University of Kentucky, United States
Xirong Chen, Assistant Professor, University of International Business And Economics, China
Zheng Li, Assistant Professor, North Carolina State University, United States

Haoying Sun, Assistant Professor, University of Kentucky, United States

Recent economics literature suggested that consumers may be rationally inattentive and not respond to small price changes. Using a large dataset consisting of eight years of grocery retail data, we estimate the magnitude of consumer inattention and demonstrate how the estimates vary with consumer demographics and product characteristics.

Saturday, 09:45 AM - 11:15 AM

191 Saturday, 09:45 AM - 11:15 AM, Piscataway — Track: Closed Loop Supply Chains

Contributed Session: Remanufacturing Issues in Supply Chains

Chair(s): Philipp Dräger

093-0019 Consumer Preferences Consider the Characteristics of Remanufactured Products

Juhong Gao, Associate Professor, Tianjin Uinversity, China
Bing Lv, Student, Tianjin University, China

The subject is driven by the remanufactured product attributes through the segmentation of the consumer market. The influence mechanism of cannibalization and consumers' willingness to pay for the remanufactured products is analyzed. Under the influence of product attributes, the conjugation effect between consumer purchase behavior and remanufacturing decision is researched.

093-1430 Competition Between OEM and IR in Remanufacturing

Rainer Kleber, Assistant Professor, Universitaet Magdeburg, Germany
Marc Reimann, Professor, University of Graz, Austria
Gilvan Souza, Professor, Indiana University Bloomington, United States
Weihua Zhang, Lecturer, University of Northumbria, United Kingdom

An OEM competes with an independent remanufacturer (IR) in remanufacturing cores acquired from the current market. Customers pay a reduced price for remanufactured products by the IR. Cores acquisition cost differential is unclear. We analyze impacts of reduced prices and cores acquisition cost differentials on optimal decisions of OEM and IR.

093-1672 Circularity of Concrete - An Economic Analysis of Market Structure and Supply Chains

Philipp Dräger, Student, Rwth Aachen University, Germany
Peter Letmathe, Professor, Rwth Aachen University, Germany

The production of recycled concrete is economically not comparable to conventional concrete and hence recycled concrete is rarely used in building construction. We empirically examine differences in market structure and supply chains in different European countries to find indicators that increase the use of recycled concrete and close the loop.

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192 Saturday, 09:45 AM - 11:15 AM, Oak Lawn — Track: Marketing and Operations Management

Contributed Session: Pricing Strategies

Chair(s): Chen Hu

093-0267 Opportunity or Threat: The Role and Pricing Strategy of E-books

Quan Li, Student, University of Science and Technology of China, China

We build a joint e-book and printed book pricing model with risk-averse consumers which consider reading experience production costs and uncertainty in content valuation. We find that the introduction of e-books is generally beneficial to publishers Surprisingly, both the sales and profits of the printed book may increase.

093-0946 Pricing Strategy and Campaign Design in Flight Crowdfunding: A Creative Way to Sell Flight Tickets

Zihao Zhang, Student, University of Science and Technology of China, China
Liuyi Ling, Associate Professor, University of Science and Technology of China, China

This paper analyzes a novel selling strategy for airlines termed "flight crowdfunding", whereby the flight will be implemented if the total amount pledged reaches a predetermined threshold. We provides an implementable model to describe the process. Our research underscores that crowdfunding might be even more attractive than previously thought.

093-0519 Dynamic Pricing with Demand Uncertainty: A Learning Approach Under Minimax Regret

Ruijing Wu, Student, Shanghai Jiao Tong University, United States

We consider a monopoly seller that sets the price of a new product dynamically. At the beginning of the selling season, the seller knows only the customer valuation support and has no information about the valuation distribution. By observing customer purchase actions, the seller continuously learns the customer valuation.

093-2456 Markdown Pricing or Trade-up Program? Demand Management with a Product Rollover

Yongbo Xiao, Associate Professor, Tsinghua University, China
Chen Hu, Student, Tsinghua University, China
Qian Liu, Associate Professor, Hong Kong University of Science and Technology, Hong Kong

We consider the pricing and timing decisions of two strategies: markdown pricing and trade-up program, both of which play important roles in demand management with a product rollover.

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193 Saturday, 09:45 AM - 11:15 AM, Northwest — Track: Operations and Sports Management

Contributed Session: Sports Operations and Research

Chair(s): Konstantin Pavlikov

093-0268 Operations and Sports Management

David Bamford, Professor, University of Huddersfield, United Kingdom
Benjamin Dehe, Reader, University of Huddersfield, United Kingdom
Iain Reid, Reader, Manchester Metropolitan University, United Kingdom
Jim Bamford, Senior Lecturer, University of Huddersfield, United Kingdom

Marina Papalexi, Lecturer, University of Huddersfield, United Kingdom

We investigated the opportunities that exist to engage in applying core Operations Management techniques within the sports sector and have arranged this around three areas: (1) Past history; (2) Present situation; (3) Future projections and opportunities. Recommendations for researchers and practitioners are made.

093-2202 Proposal for a Strategic Planning Model for Brazilian Soccer Teams

Vívian Cristina Souza, Student, Federal University of Juiz-de-Fora, Brazil
Luiz Dias Alves, Professor, Universidade Federal De Juiz De Fora, Brazil

Soccer is the most widespread sport in Brazil. Despite this, its great potential has not been taken advantage of in the best way. Researchers point to the absence of professional management as one of the main reasons, which makes it difficult to use fully efficient methodologies such as Strategic Planning.

093-1313 Algorithms and Software for the Golf Director Problem

Donald Hearn, Emeritus Professor, University of Florida, United States
Giacomo Benincasa, Senior Software Developer, Optym, United States
Konstantin Pavlikov, Assistant Professor, University of Southern Denmark, Denmark

The golf director problem is a sports management problem that aims to find an allocation of players into fair teams. This study discusses the notion of fairness, provides a solution methodology for team design, and presents a website with a variety of controls to manage and run club golf competitions.

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Saturday, 09:45 AM - 11:15 AM, Kalorama Track: Emerging Topics in Operations Management

Invited Session: Innovation in Service Operations

Chair(s): Andrew Frazelle

093-0765 A Model of Queue-Scalping

Luyi Yang, Assistant Professor, Johns Hopkins University, United States
Shiliang Cui, Assistant Professor, Georgetown University, United States

This paper studies an emerging business phenomenon referred to as queue-scalping. A queue-scalper has no interest for the service being offered but proactively enters the queue in hopes of selling his spot later. We find that a more congested service system might be a less lucrative environment for scalping.

093-1571 Efficient Inaccuracy: User-Generated Information Sharing in a Queue

Jianfu Wang, Assistant Professor, Nanyang Technological University, Singapore
Ming Hu, Professor, University of Toronto, Canada

We study a service system which does not have the capability of monitoring and disclosing its real-time congestion level. However, the customers can observe and post their observations online and future arrivals can take into account such shared information when deciding whether to go to the facility.

093-0389 Optimizing Large On-Demand Service Systems as Closed Queuing Networks

Robert Hampshire, Associate Professor, Public Policy, United States
Qi Luo, Student, University of Michigan, United States
Shukai Li, Student, University of Hong Kong, Hong Kong

We study the rebalancing and pricing problems in large-scale on-demand service systems like microtransit, ride-hailing, and temporary staffing. By using efficient approximation methods, we can compute the mean performance measures in a closed queuing network with mild compuational complexity.

093-1404 Service Delivery Platforms: Pricing and Revenue Implications

Pnina Feldman, Assistant Professor, Boston University, United States
Andrew Frazelle, Assistant Professor, University of Texas Dallas, United States
Robert Swinney, Associate Professor, Duke University Durham, United States

Platforms for restaurant delivery provide order-taking and delivery services connecting customers and restaurants. We consider how platforms should structure their relationships with service providers and compare the performance of different contractual forms when selling to rational customers. We analyze a queueing model where customers trade off rewards and waiting costs.

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Saturday, 09:45 AM - 11:15 AM, Jay Track: Retail Operations

Invited Session: Effective Merchandising and Sourcing Strategies

Chair(s): Xiajun Pan Quan Zheng

093-0246 Package Size and Pricing Decisions with a Bulk Sale Option

Dorothee Honhon, Associate Professor, University of Texas Dallas, United States
Ismail Kirci, Student, University of Texas Dallas, United States
Alp Muharremoglu, Associate Professor, Amazon.com, United States

We investigate the package size and pricing decisions of a retailer selling a perishable product in packages of a fixed pre-set size or in bulk and study the impact of these decisions on the retailer's profit and waste at the consumer level.

093-0942 Strategic Implications of Store Brands on Contracting Sequence

Hongseok Jang, Student, University of Florida, United States
Quan Zheng, Associate Professor, University of Science and Technology of China, China

Xiajun Pan, Assistant Professor, University of Florida, United States

The retailer determines whether to introduce a store brand as well as the contracting sequence with two national brands. Although simultaneous contracting is better without store brands, their presence could lead to a coopetition behavior between the national brands in simultaneous contracting, such that the retailer would prefer sequential contracting.

093-1521 Optimal Display and Ordering Policy for Perishable Products

Xiajun Pan, Assistant Professor, University of Florida, United States
Dorothee Honhon, Associate Professor, University of Texas Dallas, United States
Zumbul Atan, Assistant Professor, Eindhoven University of Technology, Netherlands

This paper considers the problem of a retailer managing the inventory and display of perishable products. We characterize the optimal ordering and display policies and study how discounting on the old products affects the retailer's optimal decisions and product waste under both deterministic and stochastic demand cases.

093-0347 A Retail Perspective on Social Labeling

Quan Zheng, Associate Professor, University of Science and Technology of China, China
Xiajun Pan, Assistant Professor, University of Florida, United States
Asoo Vakharia, Professor, University of Florida, United States

Labeling, as a means of communicating corporate social performance, is well accepted by consumers and most consumer products are sold through common independent retailers. We study social labeling in a channel setting from the perspective of a profit-driven retailer and compare the results with that of impact-motivated non-pro?t organizations.

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Saturday, 09:45 AM - 11:15 AM, Holmead East Track: Behavioral Operations Management

Contributed Session: Behavioral Issues in Healthcare, Productivity and Auctions

Chair(s): Bogdan Bichescu

093-0534 Collaborative Decision Making in Demand Forecasting

Violina Sarma, Student, Cardiff University, United Kingdom
Anthony Beresford, Professor, Cardiff University, United Kingdom
Emrah Demir, Senior Lecturer, Cardiff University, United Kingdom

Demand forecasting requires crucial decisions to be made to tackle today's uncertainty. These decisions depend on the structure of business hierarchies within organizations. We present a framework for collaborative decision-making in different business hierarchies. The framework incorporates information sharing, power, time pressure, and social value as key constructs of decision-making.

093-2152 Decision Making Approaches of Online Auction Based on the Focus Point

Yonggang Li, Assistant Professor, Dalian University of Technology, China
Xiangpei Hu, Professor, Dalian University of Technology, China
Xiaochun Feng, Student, Dalian University of Technology, China

We consider an online auction with permanent buyout options and propose a new model based on focus points to illustrate the decision making procedure. Different people are described by different types of focus points. The optimal strategy is obtained and it fits the decision procedure of human being intuitively.

093-1120 The Influence of Executive Cognitive Interpretation and Organizational Innovation: Evidence from the Healthcare Sector

Richard Rodriguez, Student, University of Texas Rio Grande Valley, United States

Healthcare executives exert major influence over innovation initiatives in healthcare products and process changes. This study examines the extent to which cognitive interpretation schema impact healthcare firm's large and small scale innovation activities. The cognition-behavior model examined forwards the degree of environmental munificence as a moderating variable.

093-1406 The Role of Physician Mobility on Hospital and Physician Performance

Bogdan Bichescu, Associate Professor, University of Tennessee Knoxville, United States

Driven by the ongoing transformation of healthcare, hospitals are increasingly seeking to financially align their hospital-affiliated physicians. Using secondary data and regression analysis, this research aims to understand the benefits and limitations of hospital employment of physicians, for both hospitals and physicians, as a function of various contextual factors.

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Saturday, 09:45 AM - 11:15 AM, Holmead West Track: Finance and Operations Management

Contributed Session: Investment and Financing

Chair(s): Askar Choudhury

093-0691 Dynamic Portfolio Management in Inventory Financing: A Copula Based Approach

bangdong Zhi, Student, University of Bristol, United Kingdom
Xiaojun Wang, Professor, University of Bristol, United Kingdom
Fangming Xu, Senior Lecturer, University of Bristol, United Kingdom

Portfolio management is widely used to mitigate risks of fluctuating asset prices. Taking advantage of Copula models and their time-series dependence structure, we investigate how a Logistics Service Provider could manage its inventory financing risk by employing the strategy of dynamic portfolio management with Copula models.

093-1291 Effect of Funding Target on Crowdfunding Failure

Joyaditya Laik, Student, University of Pittsburgh, United States

The time (and failure) to deliver promised rewards to backers in a crowdfunding campaign is correlated to the degree by which the raised amount exceeds the targeted amount. We build an analytical model to identify thresholds for demand beyond which deliveries get delayed or fail altogether.

093-0123 Fixed Asset Register Accuracy in Aviation Operations

Dan Bumblauskas, Associate Professor, University of Northern Iowa, United States
Paul Bumblauskas, President, PFC Services, Inc., United States
Amy Igou, Assistant Professor, University of Northern Iowa, United States
Ben Vaske, Student, University of Northern Iowa, United States
Kayla Hahn, Student, University of Northern Iowa, United States

Asset record keeping, equipment maintenance, and life cycle costing are of the utmost importance in financial and accounting operations. This research project addresses a Six Sigma consulting case study on fixed asset register entry for aviation operations from a large European airport including recommendations for operations management staff.

093-1665 The Dark Side of Servitization: Shareholder Value Effects of Service Provision

Antonios Karatzas, Lecturer, University of East Anglia, United Kingdom
George Daskalakis, Lecturer, University of East Anglia, United Kingdom
Mark Johnson, Associate Professor, Warwick University, United Kingdom
Marko Bastl, Assistant Professor, Marquette University, United States

We investigate the shareholder reaction to new deal announcements for the provision of different types of services in terms of their risk profile. Our analysis indicates that while pure product sales and low-risk service provision creates value for shareholders, this is not the case for medium - and high -risk - service provision.

093-1547 Life-Cycle Cost-Benefit Analysis Algorithm for Equipment Replacement with an App for Decision Making Tool

Askar Choudhury, Professor, Illinois State University, United States
Nathan Hartman, Associate Professor, Illinois State University, United States
Ted Coussens, Senior Lecturer, Illinois State University, United States

Computational algorithm is designed to assist practitioners in making cost-effective decision to upgrade existing technology through replacement. Relevant costs are utilized to select the best alternative between immediate replacements of existing technology or delaying by applying life-cycle cost analysis. An off-the-shelf "app" is created to implement the algorithm.

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Saturday, 09:45 AM - 11:15 AM, Gunston East Track: Purchasing and Supplier Management

Invited Session: Digitalization of purchasing and supply

Chair(s): Harri Lorentz Jagjit Singh Srai

093-1644 Digitalising Procurement in the UK Fresh Potato Supply System for Wastage Mitigation

Naoum Tsolakis, Post Doc/Researcher, Cambridge University, United Kingdom
Mukesh Kumar, Lecturer, University of Cambridge, United Kingdom
Jagjit Singh Srai, Reader, University of Cambridge, United Kingdom

In the UK around two-thirds of all produced fresh potatoes is wasted mainly due to mismatch between production and consumption expectations. This research maps the end-to-end potato supply chain and identifies digital interventions to address waste/losses hot-spots. The interplay between data and technology archetypes, along with network configurations, is explored.

093-1677 The Role of Collaborative E-Sourcing in Supply Chain Digitalization Scenarios: A Gamification-Enabled Structural Model

Ettore Settanni, Post Doc/Researcher, Institute for Manufacturing, United Kingdom
Jagjit Singh Srai, Reader, Institute for Manufacturing, United Kingdom

We evaluate e-sourcing in the wider context of potentially interrelated supply chain digitalization scenarios. Paired capabilities covering inbound, internal, outbound, and end-to-end are evaluated by experts through an online gamification-enabled platform. Scenario categorization, based on structural modeling, elevates their consideration beyond the single instance in which they are normally evaluated.

093-1562 Exploratory Multiple Case Study on Managers' Mental Models Regarding Digitalization of Procurement

Harri Lorentz, Associate Professor, University of Turku, Finland
Anna Aminoff, Assistant Professor, HANKEN SCHOOL OF ECONOMICS, Finland
Riikka Kaipia, Senior Lecturer, Aalto University School of Science, Finland
Jagjit Singh Srai, Reader, University of Cambridge, United Kingdom

In order to explore managers' mental models regarding digitalization of procurement, mapping exercises were conducted in eight large firms in Finland. The interview data was analyzed by using the CIMO-framework (context-intervention-mechanism-outcome). Through a cross-case analysis, a set of second-order mechanisms for digitalization outcomes in procurement was identified and elaborated.

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Saturday, 09:45 AM - 11:15 AM, Gunston West Track: Next Generation Operations

Contributed Session: Panel: Trends and Industry Perspectives with Big Data and Analytics

Chair(s): NORMA HARRISON

093-1650 Panel: Trends and Industry Perspectives with Big Data and Analytics

Norma Harrison, Professor, Macquarie University, Australia
Xiande Zhao, Professor, China Europe International Business School, China
Delton Aneato, Senior Director, IT Strategy Architecture & Planning (Americas), Brightstar, United States
Thomas Choi, Professor, Arizona State University Tempe, United States

The global market will demand platforms that help companies govern and secure big data while empowering managers to analyze the data and help them make fact-based decisions. This session will present a panel of leading managers and academics to discuss the latest developments and trends in Big Data and Analytics.

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Saturday, 09:45 AM - 11:15 AM, Fairchild East — Track: POM in Practice

Invited Session: Healthcare Operations

Chair(s): Fernanda Bravo

093-0244 An Integrated Prediction and Optimization Model for Staffing

Kimia Ghobadi, Assistant Professor, Johns Hopkins University, United States
Eric Hamrock, Senior Project Administrator, Stochastic, United States
Scott Levin, Associate Professor, Johns Hopkins University, United States
Sauleh Siddiqui, Assistant Professor, Johns Hopkins University, United States

We present an integrated short-term staffing model that utilizes a patient-census prediction simulation to inform a series of optimization problems. The model finds an optimal staffing assignment that is robust against patient variability and the uncertainty in the prediction simulation. The model is tested on a General Hospital's medical-surgical unit.

093-0903 When to Set the Next Appointment of Patients Suffering from Treatment-Resistant Depression

Martin Cousineau, Assistant Professor, Hec Montreal, Canada
Joelle Pineau, Professor, Mcgill University, Canada
Vedat Verter, Professor, Mcgill University, Canada
Gustavo Turecki, Professor, Douglas Mental Health University Institute, Canada

Deciding on the timing between appointments is an important decision due to the trade-off between high- and low-frequency appointments. Using imitation learning methods on real data, we characterize how this decision is made at an outpatient clinic treating patients suffering from treatment-resistant depression.

093-2136 Machine Learning to Address Hospital Capacity: Predicting Discharges and Identifying Opportunities to Increase Efficiency

Taghi Khaniyev, Post Doc/Researcher, Sloan School of Management, United States
Kyan Safavi, Connected Health Innovation Fellow, Massachusetts General Hospital, United States
Jonathan Zanger, Student, MIT Sloan School of Management, United States
Retsef Levi, Professor, MIT, United States
Peter Dunn, Assistant Professor, Massachusetts General Hospital, United States

We implemented a machine learning model using clinical data from 20,745 patients to identify candidates for discharge and the barriers to successfully transitioning them out of hospital. The model achieved an average AUC of 0.87 and identified an estimated 128 savable bed-days, among other results, during the 90-day study period.

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Saturday, 09:45 AM - 11:15 AM, Fairchild West — Track: Economics Models in Operations Management

Invited Session: Marketplace Innovations and Operations

Chair(s): Guangwen Kong Heng Zhang

093-2171 The Value of Price Discrimination in Large Random Networks

Jiali Huang, Student, University of Minnesota, United States
Ankur Mani, Assistant Professor, University of Minnesota, United States
Zizhuo Wang, Assistant Professor, University of Minnesota, United States

We study the value of price discrimination in large random networks. We find, surprisingly, that the value of such pricing policies in very large random networks are often not significant. We provide the exact rates at which this value grows in the size of the network.

093-2226 Consumer Information Sharing in a Distribution Channel

Buqing Ma, Student, University of Science and Technology of China, China
Guang Li, Assistant Professor, Queen's University, Canada

We study the optimal management strategy of an online retailer's customer information sharing system and investigate the effect of the retailer's strategy on the manufacturer's quality decision and consumer surplus in a distribution channel that consists of a manufacturer, an online retailer, and consumers with heterogeneous product valuations.

093-2341 The Leverage From Family and Friends: Managing Outside Funds in a Crowdfunding Campaign

Behrooz Pourghannad , Student, University of Minnesota, United States
Guangwen Kong, Assistant Professor, University of Minnesota, United States
Laurens Debo, Associate Professor, Dartmouth College, United States

We study how an entrepreneur's use of social network inflouses the crowdfunding campaign. We investigate how the investment from family and friends may impact the amount of investment that the entrepreneur could seek and how reciprocities can change the information flow.

093-2326 Position Ranking and Auctions for Online Marketplaces

Heng Zhang, Student, University of Southern California, United States
Leon Chu, Associate Professor, USC, United States
Hamid Nazerzadeh, Assistant Professor, University of South California, United States

Online e-commerce platforms such as Amazon and Taobao connect thousands of sellers and consumers every day. In this work, we study how such platforms should rank products displayed to consumers and utilize the top and most salient slots, under a framework based on consumer search.

Saturday, 09:45 AM - 11:15 AM

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Saturday, 09:45 AM - 11:15 AM, Embassy Track: Environmental Operations Management

Invited Session: Field Experiments in Sustainable Operations Management

Chair(s): Andre Calmon

093-0381 Indian Agriculture Aggregation Service Experiment

Chris Parker, Assistant Professor, Penn State University University Park, United States

We describe a field experiment evaluating the impact of a new business on Indian agriculture outcomes of interest.

093-0941 Running an SMS-Based Field Experiment in Tanzania: Stories from the Field

Jason Acimovic, Assistant Professor, Penn State University State College, United States
Christopher Parker, Assistant Professor, Penn State University University Park, United States
David Drake, Assistant Professor, University of Colorado Boulder, United States
Karthik Balasubramanian, Assistant Professor, Howard University, United States

In 2016, we ran a field experiment in Tanzania with mobile money agents. One treatment was whether agents received training; another was the nature of the daily SMS each agent received. In this discussion, we talk about the logistics and realities of the field experiment.

093-1100 Where Should I Sell? Optimal Market Selection for Farmers in an Agricultural Network

Retsef Levi, Professor, MIT, United States
Somya Singhvi, Student, Massachusetts Institute of Technology, United States
Yanchong Zheng, Associate Professor, Massachusetts Institute of Technology, United States

In this work, we collaborate with an app that pools farmers' produce and transports it to wholesale markets in India. We first predict prices and then solve a network optimization model to maximize farmer revenue across the network. Finally, we propose a field experiment to test the model's effectiveness.

093-1693 A Mobile-App Based Intervention to Improve Infant Nutrition in Underprivileged Indian Communities

Alp Sungu, Student, London Business School, United Kingdom
Kamalini Ramdas, Professor, London Business School, United Kingdom

Improving infant nutrition is a global challenge. We collaborate with a mobile app provider that offers nutrition content to parents in poor Indian communities. We will conduct a field experiment to test how aspiration and assortment of subsidized products can affect infant health and the shopping behavior of the poor.

093-1719 Effective Distribution Models for the Base of the Pyramid

Olumurejiwa Fatunde, Student, Massachusetts Institute of Technology, United States
Andre Calmon, Assistant Professor, INSEAD, France
Joann de Zegher, Assistant Professor, MIT, United States
Gonzalo Romero, Assistant Professor, University of Toronto, Canada

We partner with Essmart, a social enterprise distributing life-improving durable goods to Base of the Pyramid (BoP) consumers in India, to gather data and examine the current behavior of BoP retailers. Our goal is to conduct a field experiment to test the effectiveness of various distribution models.

204

Saturday, 09:45 AM - 11:15 AM, Du Pont Track: Revenue Management and Pricing

Invited Session: Retail Operations and Online Advertising

Chair(s): Sajad Modaresi Sajad Modaresi

093-0199 Dynamic Pricing Under a Static Calendar

Will Ma, Student, Massachusetts Institute of Technology, United States
David Simchi-Levi, Professor, Massachusetts Institute of Technology, United States
Jinglong Zhao, Student, Massachusetts Institute of Technology, United States

From our collaborations with a large Consumer Packaged Goods company, they deem it operationally beneficial to plan out a deterministic price calendar in advance. Motivated by this, we study dynamic pricing and assortment problems under a static calendar, and propose constant-factor approximation heuristics to show its efficacy.

093-0594 Shapley Meets Uniform: An Axiomatic Framework for Attribution in Online Advertising

Omar Besbes, Associate Professor, Columbia University, United States
Antoine Desir, Assistant Professor, INSEAD, France
Vineet Goyal, Associate Professor, Columbia University, United States
Garud Iyengar, Professor, Columbia University, United States
Raghav Singal, Student, Columbia University, United States

We develop an axiomatic framework for attribution in online advertising. Under a Markovian model for user behavior, we illustrate limitations of existing heuristics and propose a novel framework motivated by causality and game theory. Furthermore, we establish that our framework coincides with an adjusted "unique-uniform" attribution scheme.

093-1163 Inventory Integration with Rational Consumers

Arian Aflaki, Assistant Professor, Joseph M. Katz Graduate School of Busine, United States
Robert Swinney, Associate Professor, Duke University Durham, United States

We study the value of inventory integration for firms selling seasonal goods to rational consumers who consider whether and when to visit based on their cost of visiting the firm, the price of the product, and its anticipated availability. We derive conditions under which this value is largest and smallest.

093-0202 Attribute-Based Modeling of Product Recommendations

Sajad Modaresi, Assistant Professor, University of North Carolina Chapel Hill, United States
Fernando Bernstein, Professor, Duke University Durham, United States
Denis Saure, Assistant Professor, Universidad De Chile, Chile

We study efficient real-time data collection approaches for an online retailer that dynamically personalizes assortments based on customers' attributes. We propose policies that leverage transaction data of customers with similar attributes to expedite the learning process and maximize revenue. We test the performance using a dataset from a Chilean retailer.

205

Saturday, 09:45 AM - 11:15 AM, Cardozo Track: Data Science

Invited Session: Tutorial: Learning with Side Information, by Professor Vivek Farias

Chair(s): Zeyu Zheng

093-2411 Tutorial: Learning with Side Information

Vivek Farias, Associate Professor, Massachusetts Institute of Technology, United States

Tutorial

206

Saturday, 09:45 AM - 11:15 AM, Coats Track: Social Media and Internet of Things

Contributed Session: Tutorial: Promote Sustainability Through Sensors and Cloud Computing

Chair(s): Andrew Whinston

093-2439 Promote Sustainability Through Sensors and Cloud Computing

Andrew Whinston, Professor, The University of Texas at Austin, United States
Cenying Yang, Student, The University of Texas at Austin, United States

We propose a framework of promoting sustainability through Internet of Things and cloud computing. We explore how technology could help grocery retailers to better distribute food, and thus reducing food waste. We demonstrate how to monitor ripeness of fresh produce using raspberry pi, sensors and cloud.

207

Saturday, 09:45 AM - 11:15 AM, Columbia 1 Track: Scheduling and Logistics

Invited Session: Theoretical Models in Scheduling and Logistics

Chair(s): Gopalakrishnan Easwaran

093-1478 Estimation of Disaggregated Freight Flows via a Real-Valued Genetic Algorithm

Javier Rubio-Herrero, Assistant Professor, St. Mary'S University, United States
Jesús Muñuzuri, Professor, Universidad De Sevilla, Spain

We introduce a method for estimating disaggregated commodity flows when only aggregated data per origin-destination (OD) pair are provided. We use a doubly-constrained gravity model that is calibrated with a genetic algorithm. We apply this method to the case of the interregional transportation of ten different products in Spain.

093-1867 Distribution of Permutation Flowshop Sequences

Rafael Moras, Professor, St. Mary'S University, United States
Paul Uhlig, Professor, St. Mary's University, United States
Gopalakrishnan Easwaran, Associate Professor, St. Mary'S University, United States

We investigate the conditions for which the population of sequences (or subsets of such population) in a permutation flowshop are asymptotically normal. The performance measure considered includes makespan, mean flowtime, and mean lateness. Randomly structured and special cases of machine and job domination are considered.

093-1953 Antithetic Sequences in Flowshop Scheduling: Special Cases of Monster-Cell Dominance

Paul Uhlig, Professor, St. Mary'S University, United States
Rafael Moras, Professor, St. Mary'S University, United States
Gopalakrishnan Easwaran, Associate Professor, St. Mary'S University, United States

The effects monster cell of dominance in flow shop scheduling with minimization of mean lateness and makespan are described. Insights into this type of dominance and its effect on the behavior of antithetically related sequences (a sequence and its reverse) are discussed.

093-2175 Performance Evaluation of Traditional, Cross-Channel, and Multi-channel Logistics Network Configurations

Gopalakrishnan Easwaran, Associate Professor, St. Mary's University, United States
Tarik Gulbas, Student, St. Mary's University, United States
Rafael Moras, Professor, St. Mary's University, United States

Considering a three-echelon logistics network characterized by multiple products, time-varying demand, transportation lead-times, multiple modes of transportation, forward and reverse flows, and single- or multi-sourcing restrictions, we compare the traditional, cross-channel and multi-channel logistics network configurations with respect to a selected set of SCOR performance metrics.

Saturday, 09:45 AM - 11:15 AM

208

Saturday, 09:45 AM - 11:15 AM, Columbia 2 Track: Operational Excellence

Invited Session: Tutorial: Industry 4.0 and Digitization of Manufacturing

Chair(s): Fabrizio Salvador

093-2407 Industry 4.0 and Digitization of Manufacturing

Fabrizio Salvador, Professor, IE BUSINESS SCHOOL, Spain

This session will provide an overview of Industry 4.0 and digitization of manufacturing.

209

Saturday, 09:45 AM - 11:15 AM, Columbia 3 Track: Healthcare Analytics

Contributed Session: Improving Healthcare Service Delivery

Chair(s): Yucheng Chen

093-0808 A Unified Framework for Preventive Healthcare Service Design: Patient-Physician Collaboration

M Gabriela Sava, Assistant Professor, Clemson University, United States
Jerrold May, Professor, University of Pittsburgh, United States
Jennifer Shang, Professor, University of Pittsburgh, United States
Luis Vargas, Professor, University of Pittsburgh, United States
James Dolan, Professor, University of Rochester, United States

As patients are increasingly becoming active participants in making their medical decisions, healthcare providers are increasing their focus on patient-centered care. We propose a new service design for shared decision-making, which incorporates analytically both patients' preferences and physicians' expertise into a joint patient-physician model to assess, aggregate, and synthesize preferences.

093-2106 Analyzing the Impact of FDA-Approved Chemotherapy Agents on Clinical Practice

Alireza Boloori, Student, Arizona State University Tempe, United States
John Fowler, Professor, Arizona State University Tempe, United States
Srimathy Mohan, Associate Professor, Arizona State University Tempe, United States
Mohan Gopalakrishnan, Associate Professor, Arizona State University Tempe, United States
Alan Bryce, Assistant Professor, Mayo Clinic, United States

Using a data set of patients who receive chemotherapies at Mayo Clinic, we develop a simulation model with a process-mapping approach to identify sources of system's waste, including (1) inefficient scheduling for staff/patients, (2) unnecessary waiting time for patients, and (3) not effectively and efficiently utilizing staff skills.

093-0951 Medication Therapy Management Services – Pharmacy Service Process Redesign

Yucheng Chen, Student, University of Connecticut, United States
Manuel Nunez, Associate Professor, University of Connecticut, United States
Stephanie Gernant, Assistant Professor, University of Connecticut, United States
Charles Upton, Assistant Professor, University of Connecticut, United States

We use queuing models to assess economies of scale, redesign workflows, and improve capacity management at pharmacies offering Medication Therapy Management (MTM) services. MTM is a process aimed at optimizing drug therapy and improving therapeutic outcomes of medication-controlled conditions in patients through direct counselling and follow up with pharmacists.

210

Saturday, 09:45 AM - 11:15 AM, Columbia 4 Track: Healthcare Analytics

Invited Session: Emergency Care and Information Use in Healthcare

Chair(s): Marco Bijvank

093-0141 Design of Specialist Response Policies in Emergency Departments: A Data-Driven Approach

Cheng Zhu, Post Doc/Researcher, Nanjing University, Canada
Beste Kucukyazici, Assistant Professor, Mcgill University, Canada
Zhankun Sun, Assistant Professor, City University of Hong Kong, Hong Kong

We aim to reduce the length of stay (LOS) in Emergency Departments (EDs) by designing a systematic response policy for various specialists depending on the demands of their consultation by modeling the specialist consultation (SC) demands via non-homogeneous poisson process of a daily cycle, motived by real-life individual level data.

093-2051 Physician Staffing and Shift Scheduling at Emergency Departments with Time Varying Productivity

Negar Ganjouhaghighi, Student, University of Calgary, Canada
Marco Bijvank, Assistant Professor, University of Calgary, Canada
Alireza Sabouri, Assistant Professor, University of Calgary, Canada

The number of new patient assessments per hour during the shift of a physician at emergency departments is decreasing. We incorporate the stochastic nature of both patient arrivals and physician productiveness in deciding the number of shifts to schedule as well as the starting and ending time of these shifts.

093-2236 How Does Health IT Impact Malpractice Claims?

Deepti Singh, Student, University of South Florida, United States

Our study examines the impact of Health IT on the practitioners through medical liability claims filed on record in Florida from 2011 to 2016. We examine the impact on the information failures in the clinical processes during different stages of Health IT.

093-1528 Evidence of Hot-Hand Bias in Medical Decision-Making

Lawrence Jin, Assistant Professor, National University of Singapore, Singapore

This paper finds evidence of hot-hand bias in physicians' decision-making during childbirth. I utilize 1.3 million hospital admissions for childbirth in New York State over 2010-2015, and find that physicians are 2% more likely to perform a C-section after having previously performed a successful C-section. Welfare implications are discussed.

211

Saturday, 09:45 AM - 11:15 AM, Columbia 5 Track: Healthcare Operations Management

Invited Session: Human-Centric Healthcare Operations

Chair(s): David Rea Craig Froehle

093-1419 Assessing Cost-Effectiveness of Behavioral Health Interventions with Incomplete Participation

Murray Côté, Associate Professor, Texas A&M University, United States
Tiffany Radcliff, Professor, Texas A&M University, United States
Melanie Whittington, Assistant Professor, University of Colorado Denver, United States
Michael Daniels, Professor, University of Florida, United States

Is an effective weight reduction intervention that involves both education and behavioral coaching also cost-effective in reducing Type 2 Diabetes? Our cost-effectiveness analysis examined participant transitions across HbA1C levels over time. Markov chains, Monte Carlo simulation, and imputed data methods identified lower expected costs and higher Quality Adjusted Life Years.

093-0304 Toward an Effective Design of Preventive Health Care Delivery: Collaboration With Primary Care Providers

Yingchao Lan, Assistant Professor, University of Nebraska Lincoln, United States
Aravind Chandrasekaran, Associate Professor, Ohio State University, United States

While both practitioners and researchers have recognized the importance to design an effective preventive care delivery system to improve population health and health delivery efficiency, it's still unclear how. This paper addresses this gap by studying how collaboration with primary care providers can improve population health and efficiency.

093-0432 Risk-Averse Appointment Scheduling

Ken Klassen, Professor, Brock University, Canada
Amir Ahmadi, Associate Professor, Amirkabir University of Technology, Iran (Islamic Republic of)
Zahra Jalali, Student, McGill University, Canada

Most prior work in outpatient appointment scheduling has assumed the decision maker is risk-neutral. This research considers the perspective of a risk -averse decision maker. We show how prior reported findings for optimal appointment-scheduling policies can be adjusted if the scheduler wants to avoid risk.

093-0754 Ensuring Fairness in Physician Time Allocation: A Multi-Objective Optimization Approach

David Rea, Student, University of Cincinnati, United States
Craig Froehle, Professor, University of Cincinnati, United States
Brian Stettler, Associate Professor, University of Cincinnati, United States
Suzanne Masterson, Professor, University of Cincinnati, United States
Arthur Pancioli, Professor, University of Cincinnati, United States

Fairness in resource allocation problems remains poorly defined despite its widespread importance. Viewing fairness as a form of organizational justice, we demonstrate how to allocate physician clinical time while balancing two competing aspects of fairness - equity and equality - using primary data and multi-objective optimization.

212

Saturday, 09:45 AM - 11:15 AM, Columbia 6 Track: Healthcare Operations Management

Invited Session: Staffing in Healthcare Operations

Chair(s): Feng (Susan) Lu

093-0331 Turnover Among Part-Time Nursing Aides: Scheduling Smarter

Kevin Mayo, Student, Indiana University, United States
Eric Webb, Assistant Professor, University of Cincinnati, United States
Kurt Bretthauer, Professor, Indiana University, United States
George Ball, Assistant Professor, Indiana University Bloomington, United States

Extremely high turnover rates among part-time nurse aides can have significant negative effects on patient outcomes. We examine 6,634 part-time nurse aides and 5,305 turnovers to determine how scheduling affects turnover. We identify the turnover impacts of the amount, variation, and type of scheduling, providing managerial insights to reduce turnover.

093-0491 Staffing for Better Outcomes: Insights from Blood Donation

Wilson Lin, Student, University of Southern California, United States
Tianshu Sun, Assistant Professor, University of Southern California, United States
Feng (Susan) Lu, Associate Professor, Purdue University, United States
Ginger Jin, Professor, University of Maryland, United States

How can organizations leverage staffing to achieve better outcomes? Using micro-level data from a major Chinese blood bank, we estimate nurse-donor matching's effect on a donor's donation volume and return likelihood. We identify a trade-off between short and long term outcomes and find improved matching can provide economically significant benefits.

093-0574 Impact of Supplemental and Float Staffing Policies on Perceived Quality of Care

Adelina Gnanlet, Associate Professor, California State University Fullerton, United States
Luv Sharma, Assistant Professor, University of South Carolina, United States
Christopher Mcdermott, Associate Professor, Rensselaer Polytechnic Institute, United States
Muge Yayla-Kullu, Associate Professor, University of Central Florida, United States

In this paper, we study the effect of supplemental and float staffing on perceived quality of care at the unit-level in hospitals and hypothesize a moderating effect of workload and severity of patient illness in the unit on this relationship.

093-1515 Managing Patient Panels with Non-Physician Providers

Hessam Bavafa, Assistant Professor, University of Wisconsin-Madison, United States
Sergei Savin, Professor, University of Pennsylvania, United States
Christian Terwiesch, Professor, The Wharton School, United States

There is a recent push to use more non-physician providers to save costs in primary care delivery. In this paper, we develop an analytical model to study the impact of such non-physician providers on key system outcomes including physician compensation and patient health.

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Saturday, 09:45 AM - 11:15 AM, Columbia 7 Track: Supply Chain Management

Invited Session: SCM Best Student Paper Competition 1

Chair(s): Georgia Perakis

093-2465 Disruptions Resilience and Performance of Emerging Market Entrepreneurs: Evidence from Uganda

Amrita Kundu, Student, London Business School, United Kingdom
Stephen Anderson, Assistant Professor, Stanford University, United States
Kamalini Ramdas, Professor, London Business School, United Kingdom

We examine the effect of firm-specific business disruptions (both managerial and operational) on the performance of small firms in emerging markets and the effectiveness of appropriate resilience strategies in buffering against these disruptions, using a hand-built panel data set on 646 small firms over four time periods in Kampala, Uganda.

093-2466 Estimating Customer Trends to Target Promotions

Tamar Cohen-Hillel, Student, Massachusetts Institute of Technology, United States
Lennart Baardman, Student, Massachusetts Institute of Technology, United States
Setareh Boroujeni, Principal Scientist, Oracle, United States
Kiran Panchamgam, Senior Scientist, Oracle, United States
Georgia Perakis, Professor, Massachusetts Institute of Technology, United States

Detecting trends can help retailers determine effective personalized promotion plans. We introduce a personalized demand model that captures customer-trends from transaction data. Moreover, we develop a provably-good greedy approach for the promotion targeting problem. Using data from a large fashion retailer, we test our customer-trend model and the targeting algorithm

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093-2467 An Economic Analysis of Agricultural Support Prices in Developing Economies

Harish Guda, Student, University of Texas Dallas, United States
Tharanga Rajapakshe, Assistant Professor, University of Florida, United States
Milind Dawande, Professor, University of Texas Dallas, United States
Ganesh Janakiraman, Professor, University of Texas Dallas, United States

A Guaranteed Support Price (GSP) for a crop is a guaranteed per-unit price, announced before the growing season, at which a governmental entity promises to procure the crop from farmers. We derive analytically supported insights on the welfare implications of a GSP scheme and examine related questions

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Saturday, 09:45 AM - 11:15 AM, Columbia 8 Track: Supply Chain Management

Invited Session: Topics in the Sharing Economy

Chair(s): Edward Anderson Kaitlin Daniels

093-1292 Automated Vehicles and Ride Sharing: How Falling Costs of Driving Influence Consumers' Willingness to Pool

Sergey Naumov, Student, Massachusetts Institute of Technology, United States
David Keith, Assistant Professor, Massachusetts Institute of Technology, United States

We estimate consumer preferences for the attributes of ride-hailing services using discrete choice experiments. Among other results, we find that contrary to analyst expectations, consumer use of pooling will drop if the cost of driving falls with the introduction of autonomous vehicles because the financial incentive to pool is reduced.

093-0375 Optimal Price and Service Competition Decisions Based on the Internet Platform Operator Leasing Mode

Xue-Jie Ren, Student, Southeast University, China
Lindu Zhao, Professor, Southeast University, China

Motivated by the bike-sharing system, two competition supply chains in which the manufacturer sells products to the internet platform operator and then leases products to customers are considered. Differential equations are established to describe the demands. The optimal wholesale price, lease price, and service level are investigated and shown by simulations.

093-2405 Free-Ride Policies in Free-Floating, Electric Vehicle Share Systems

Fernanda Bravo, Assistant Professor, UCLA Anderson School of Management, United States
Bobby Nyotta, Student, University of California Los Angeles, United States
Jacob Feldman, Assistant Professor, Washington University St Louis, United States

We study the effectiveness of offering free rides to charging stations in a dockless, electric vehicle share system. These rides keep vehicles charged and rebalance the system, but do not generate revenue. We find simple offer policies are nearly optimal and validate the performance in simulations using real operations data.

093-2124 Capacity Constrained Two Sided Markets

Kaitlin Daniels, Assistant Professor, Washington University St Louis, United States

The gig-economy commonly pays its workers a fixed percentage of the price of each service the worker completes. We study the performance of this payment scheme using the classic two-sided market context as a benchmark.

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Saturday, 09:45 AM - 11:15 AM, Columbia 9 Track: Behavioral Operations Management

Invited Session: Trust and Supplier Relations in OM

Chair(s): Kyle Hyndman

093-2301 The Role of Trust in Aligning Capacity Decisions in Supply Chains

Sara Benetti, Student, INCAE, Costa Rica
Florian Federspiel, Assistant Professor, INCAE, Costa Rica
Kyle Hyndman, Associate Professor, University of Texas Dallas, United States
Santiago Kraiselburd, Associate Professor, INCAE, Costa Rica
José Lopez Quirós, Student, INCAE, Costa Rica

We study behavior in a series of two-player supply chain game experiments. We focus on the differences in behavior under fixed pairs (i.e., in repetitive games). We will measure ex ante, and ex post trust and how it interacts with outcomes and decisions.

093-2408 Network Trust and Executive Behavior in Supply Chain Interactions

Emily Choi, Assistant Professor, University of Texas Dallas, United States
Ozalp Ozer, Professor, University of Texas Dallas, United States
Yanchong Zheng, Associate Professor, Massachusetts Institute of Technology, United States

We study how and when trust and trustworthiness impact high-level executives' decisions in supply chain interactions and offer insights about how organizations can better leverage such knowledge. To do so, we carry out a social network analysis and behavioral experiments with over 250 executives from several Fortune 500 companies.

093-2272 Risk Taking Behavior and Optimism Bias in Social Feedback Contexts

Musen Li, Student, Tsinghua University, China
Jiayi Yu, Post Doc/Researcher, Tsinghua University Department of IE, China

People often have optimism bias when they evaluate themselves, which can affect their decision-making and risk-taking behaviors. We design an experiment to investigate how people's risk-taking behavior and optimism bias changes in different social feedback contexts.

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Saturday, 09:45 AM - 11:15 AM, Columbia 10 Track: Product Innovation and Technology Management

Invited Session: Entrepreneurship and Innovation

Chair(s): Sinan Erzurumlu

093-0448 Designing Reward Structure for Crowdfunding Campaigns

Param Pal Singh Chhabra, Student, Georgia Institute of Technology, United States
Karthik Ramachandran, Associate Professor, Georgia Institute of Technology, United States
Manpreet Hora, Associate Professor, Georgia Institute of Technology, United States

This study empirically investigates the association between reward structure design and performance of a crowdfunding campaign. Using data for campaigns on a crowdfunding platform, we assess parameters that are part of a reward structure design. We test the hypothesized associations and make recommendations for creators to improve campaign performance.

093-1634 On Mimicry: Why Healthcare's Adoption of Approaches from Tech Limits Innovation

Wiljeana Glover, Assistant Professor, Babson College, United States
Eitan Naveh, Associate Professor, Israel Institute of Technology, Israel
Noa Nissinboim, Student, Israel Institute of Technology, Israel

Hospital leaders have accelerated investment in innovation using approaches from the product design and technology fields. However, scholars caution healthcare leaders about adopting approaches from other industries without considering the organizational context. This article seeks to examine the relationship between determinants and moderators of innovation in hospital settings.

093-1357 Managing Entrepreneurial Risk: An Operations Management Framework

Jennifer Bailey, Assistant Professor, Babson College, United States

We link two separate streams of research: Entrepreneurship and Operations Management, to develop a framework for managing risk in new ventures, using a stage-based venture life-cycle perspective.

093-0428 Delegated Search's Impact on Startup Supply Chain Contracting and Order Allocations

Berke Guzelsu, Student, Boston University, United States
Nitin Joglekar, Associate Professor, Questrom School of Business, United States

We examine the effects of a delegated search on startup supply chain contracting when a large supplier presents a poaching threat. Using a game theory framework, we evaluate the order allocation decision an entrepreneurial firm can make to influence the collaborative supplier's level of experimentation that influences market size.

093-0303 Identifying Drivers of Commercial Value of Healthcare Innovations

Sinan Erzurumlu, Associate Professor, Babson College, United States
Dessi Pachamanova, Professor, Babson College, United States

We develop a framework for identifying factors that contribute to the commercial value of innovations. We illustrate the approach on data from a large healthcare provider and discuss strategic implications of the findings.

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Saturday, 09:45 AM - 11:15 AM, Columbia 11 Track: Inventory Management

Invited Session: Tutorial: Asymptotic Analysis of Constant-Order Policies in Inventory Models with Lead Times

Chair(s): Linwei Xin

093-2400 Tutorial: Asymptotic Analysis of Constant-Order Policies in Inventory Models with Lead Times

Linwei Xin, Assistant Professor, University of Chicago, United States

In this tutorial, we will provide an overview of recent research on asymptotic analysis of constant-order policies in inventory models with lead times. We will also discuss new research directions as well as open questions.

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Saturday, 09:45 AM - 11:15 AM, Columbia 12 Track: Service Operations

Invited Session: Management Issues for Online Platforms

Chair(s): Kejia Hu

093-0921 Managing Workplace Flexibility

Vasiliki Kostami, Associate Professor, HEC Paris, France

In most workplaces, employees are expected to excel in different skills and are heterogeneous in their task preferences. We study two innovative arrangements in the workplace related to flexibility in task assignment so as to improve everyone's welfare.

093-1134 Best or Right – The Interaction Between Subjective Preferences and Authentication in Online Matching Platforms

Amit Basu, Professor, Southern Methodist University, United States
Sreekumar Bhaskaran, Associate Professor, Southern Methodist University, United States
Rajiv Mukherjee, Assistant Professor, Southern Methodist University, United States

When companies look to match with business partners, they want to find the best candidate. However, a high-quality partner who excels on some set of criteria may be of little value if the focal match-seeker realizes, ex-poste, that the relevant criteria are different. Our paper examines this trade-off.

093-1155 Revenue Management for Parking with Advanced Reservations

Qingchen Wang, Student, University of Amsterdam, Netherlands
Ruben van de Geer, Student, Vrije Universiteit Amsterdam, Netherlands
Arnoud Den Boer, Assistant Professor, University of Amsterdam, Netherlands

We develop a data-driven solution to optimize the pricing and blocking policy of advance reservations for a smart parking technology company. This problem differs from a standard revenue management problem due to unknown and variable times of arrival and lengths-of-stay, so formulating a dynamic programming model would thus be infeasible.

093-1164 Shape Demand Peaks and Valleys in Service Industries Using Online Deals

Simin Li, Student, Northwestern University, United States
Kejia Hu, Assistant Professor, Vanderbilt University, United States
Martin Lariviere, Professor, Northwestern University, United States

We empirically study how service providers design online deals advance sales period (T) and discount tailoring to operating margin and market demand change to smooth holiday demand swings. We find an average profit increase of 78% if T is strategically designed.

219

Saturday, 09:45 AM - 11:15 AM, Monroe Track: Humanitarian Operations and Crisis Management

Invited Session: Data Analytics in the Humanitarian Sector: Improving Income and Service

Chair(s): Iman Parsa

093-0798 Humanitarian Service Operations: Reframing the Flood Disaster Recovery Processes

Niratcha Tungtisanont, Assistant Professor, University of Maryland, United States
Aleda Roth, Professor, Clemson University, United States

We draw upon the service strategy literature, we consider the roles of various stakeholders–individuals, communities, and governments–in the co-production disaster relief services and activities. This service operations strategy framework provides an overarching road map that informs research and practice for improving the effectiveness of a flood disaster recovery.

093-1269 Text Analytics in Humanitarian Logistics Research: Challenges and Opportunities

Nathan Kunz, Assistant Professor, University of North Florida, United States

Access to data is a challenge in humanitarian logistics research. However, humanitarian organizations publish large amounts of text that researchers can use (reports, news, social media, etc.,). This study presents an automated content analysis method to extract valuable data from large volumes of text. It discusses some challenges of this technique.

093-1543 Managing Commodity Stock-Outs in Public Health Supply Chains in Developing Countries: An Empirical Analysis

Amir Karimi, Student, University of Minnesota, United States
Karthik V. Natarajan, Assistant Professor, University of Minnesota, United States
Kingshuk Sinha, Professor, University of Minnesota, United States

Public health supply chains in developing countries are faced with frequent incidents of health commodity stock-outs in the last-mile. Using data from the field, we investigate the drivers of stock-outs and uncover mitigation mechanisms that health facilities in the last-mile can leverage to minimize the risk of stock-outs.

093-2215 Improving Hunger Relief Food Donation Programs: A Socially Responsible Supply Chain Innovation

Kenneth Boyer, Professor, Ohio State University, United States
John Lowrey, Student, Ohio State University, United States

Many large grocery Retail Chains share ambitious goals related to social impact and the community. Walmart, for example, has committed to donate 4 billion meals to fight hunger by 2020. However, many food donation programs are operated ad-hoc. We explore how to optimize food donations.

093-2096 What Drives Humanitarian Organizations' Donation Income: An Empirical Investigation

Iman Parsa, Student, Arizona State University, United States
Mahyar Eftekhar, Assistant Professor, Arizona State University Tempe, United States
Charles Corbett, Professor, UCLA Anderson School of Management, United States

Humanitarian organizations rely heavily on donations. We empirically study the impact of a wide range of factors on individual donations and government grants that humanitarian organizations receive to identify mechanisms by which they can increase their donation income. These factors include program spending ratio, fundraising investment, transparency, and media exposure.

220

Saturday, 09:45 AM - 11:15 AM, Lincoln East Track: Empirical Research in Operations Management

Contributed Session: OM-Finance interface & Value Delivery

Chair(s): cherry singhal

093-0074 Sustainability Certification Announcements and Stock Market Reaction: The role of Legitimacy

Yunting Feng, Student, Shanghai Jiao Tong University, China
Qinghua Zhu, Professor, Shanghai Jiaotong Univerisity, China

The relationship between sustainability certification and financial performance is studied, but fails to draw a consistent result and is rarely considered from the legitimacy view. We clarified the disputes by showing that the financial performance of sustainability certifications are contingent on the firms' legitimacy by the government and their sociopolitical legitimacy.

093-2173 An Empirical Study of Risk Signals with Actions and Outcomes in P2P Lending Markets

Hoda Atef Yekta, Assistant Professor, Youngstown State University, United States

This study seeks to shed light on the interplay between the players in Peer-to-Peer lending markets, showing how signals from one class of participants affects the behavior of others using data analytics tools on a large dataset of publicly available loan information for over four years of loan origination requests.

093-1713 Exploration of the Value Delivery Process in Social Entrepreneurship: An Empirical Study

Anil Kumar, Student, Tata Institute of Social Sciences, India
Satyajit Majumdar, Professor, Tata Institute of Social Sciences, India
Ajit Kumar, Student, National Instituteof Industrial Engineering, Mumbai, India
Gautam Prakash, Assistant Consultant, TCS, India

Value delivery is the strategy execution process to achieve the organizational mission. After conducting case studies of three social enterprises in the agri-tech sector, we have found that technology, market disruption and integration, community-friendly value proposition, innovative processes, and integrated entrepreneurial opportunity exploration are keys to the value delivery.

093-2339 Implications of OM-Related Imitation on Financial Performance of Manufacturing Firms

cherry singhal, Assistant Professor, University of New Mexico, United States
Alan Mackelprang, Associate Professor, Georgia Southern University, United States
Manoj Malhotra, Professor, Case Western Reserve University, United States

Innovation and imitation are both established strategies for augmenting firm profitability. Expropriation of the innovating firm's innovation benefits the imitating firm, but financially hurts the innovating firm. Using RBV, the study investigates the factors that account for the variability in the benefits of imitation and the factors influencing that choice.

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Saturday, 09:45 AM - 11:15 AM, Lincoln West Track: Empirical Research in Operations Management

Invited Session: Empirical and Theoretical Research on New Business Models

Chair(s): Ashish Kabra

093-1899 "Seemingly-Beneficial" Interventions: Model, Analysis, and Applications to Omnichannel Retail

Harish Guda, Student, University of Texas Dallas, United States
Milind Dawande, Professor, University of Texas Dallas, United States
Ganesh Janakiraman, Professor, University of Texas Dallas, United States

Our work examines a "seemingly-beneficial" intervention: for any fixed actions of the firm and its consumers, the profit of the firm is higher in the presence of the intervention relative to that in its absence. We identify fundamental characteristics that determine whether such an intervention helps or hurts the firm.

093-1418 Designing and Evaluating Dynamic Pricing for Major League Baseball Tickets

Xu Joseph (Jiaqi), Assistant Professor, Carnegie Mellon University, United States
Peter Fader, Professor, The Wharton School, University of Pennsylvania, United States
Senthil Veeraraghavan, Professor, The Wharton School, University of Pennsylvania, United States

Dynamic pricing has become a widely adopted practice in the sports entertainment industry, but practitioners face numerous challenges in its implementation. We develop and estimate a demand model that can be used to evaluate and design dynamic pricing policies for single-game tickets by a sports team.

093-1695 Forecasting Housing Market Health with Customer Search Patterns

Emily Mower, Student, Harvard University, United States

Recent literature shows that aggregate search measures, like Google Trends, can improve nowcast models significantly. Companies often have much more detailed search measures. In this paper, we demonstrate the value of micro-level search data in nowcasting and forecasting housing market health, using data from a large online real estate platform.

093-1553 Matching Dynamics in a Peer-to-Peer Freelancer Matching Market

Ashish Kabra, Assistant Professor, University of Maryland, United States
Qingchen Wang, Student, University of Amsterdam, Netherlands

Several two-sided matching platforms exhibit a much larger heterogeniety in their demand and supply users (eg: Airbnb, Taskrabbit) compared to some of the other mainsteam platforms (eg: Uber, Ofo). In collaboration with a large scale freelancer matching platform, we study the drivers of the match selection behavior using machine learning.

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Saturday, 09:45 AM - 11:15 AM, Jefferson East Track: Panels & Meetings

Contributed Session: Emerging Scholars 2

Chair(s): Goker Aydin

093-2434 Emerging Scholars 2

Goker Aydin, Professor, Johns Hopkins University, 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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Saturday, 09:45 AM - 11:15 AM, Georgetown East Track: Supply Chain Risk Management

Invited Session: Managing Environmental and Social Responsibility Risk in Supply Chains

Chair(s): Chengzhang Li

093-0404 The Missing Link? The Strategic Role of Procurement in Building Sustainable Supply Networks

Veronica Villena, Assistant Professor, Penn State University University Park, United States

The increasing number of scandals about supplier violations of environmental and social regulations has put companies' reputations at risk. These companies require their suppliers to comply with their sustainability requirements and ask them to "cascade" such requirements to their (lower-tier) suppliers. This research investigates why this cascading effect often fails.

093-1260 Customer Concentration and Supplier's Corporate Social Performance

xiaoping zhao, Assistant Professor, Shanghai Jiao Tong University, China
Ying Rong, Professor, Shanghai Jiao Tong University, China
jia gao, Student, shanghai jiaotong university, China

Although there are extensive studies about Corporate Social Performance (CSP), our understanding of CSP in supply chain context is limited. In this study, we first identify the correlation between customer concentration and supplier's CSP. Then we investigate several key factors to help to explain this correlation.

093-1225 Hazardous Materials (Hazmat) Transport Risk Assessment: A Speed -Based Approach

ZAFER YILMAZ, Assistant Professor, TED University, Turkey
Vedat Verter, Professor, Mcgill University, Canada

The past accident data is used for traditional hazmat transportation risk assessments. In addition to traditional hazmat risk assessment methodologies we developed a speed-based methodology in which different vehicle speeds that affect the risks of involvment in fatal accidents are focused to find more realistic solutions for hazmat transportation.

093-0410 Implementing Environmental and Social Responsibility (ESR) Programs in Supply Networks Through Multi-Unit Bilateral Negotiation

Qi Feng, Professor, Purdue University, United States
Chengzhang Li, Student, Purdue University, United States
Mengshi Lu, Assistant Professor, Purdue University, United States
George Shanthikumar, Professor, Purdue University, United States

We study ensuring ESR in general supply chain networks through multi-unit bargaining. We derive the equilibrium negotiation outcome and demonstrate its advantages over existing approaches. We also investigate the initiator's preferred implementation structure and various extensions including multiple ESR effort levels, sequential formation of ESR relationships, and multiple ESR programs.

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Saturday, 09:45 AM - 11:15 AM, Georgetown West Track: Retail Operations

Invited Session: Retail in Emerging Markets

Chair(s): Jiwen Ge

093-0308 Financing Small and Medium-Size Enterprises via Retail Platforms

Lingxiu Dong, Professor, Washington University St Louis, United States
Long Ren, Assistant Professor, University of International Business And Economics, China
Dennis Zhang, Assistant Professor, Washington University St Louis, United States

This paper studies the multifaceted impact of loan programs initiated by a retail platform to its sellers on these sellers' operational and financing decisions, profits of the sellers and the platform, as well as consumer welfare.

093-0891 The Impact of Congestion and Polycentricity on Urban Distribution Strategies

Christopher Mejia-Argueta, Assistant Professor, Center for Transportation and Logistics, United States
Youssef Boulaksil, Associate Professor, United Arab Emirates Univ, United Arab Emirates
Jan Fransoo, Professor, Kuehne Logistics University, Germany

We formulate an optimization model that incorporates an index with time-dependent congestion levels. The model allows for economic evaluation of distribution models in distinct urban designs. Congestion levels drive to a more decentralized urban distribution network under sufficient capacity by more cross-docking platforms and indirect deliveries to serve polycentric urban designs.

093-1531 Contract Design for the Stockist in Indian Distribution Networks

Ananth Iyer, Professor, Purdue University, United States
Omkar Palsule-Desai, Assistant Professor, IIMA, India

Stockists deliver to millions of small shops that account for over 90% of retail sales in India. We focus on the analysis of contracts offered by manufacturers to stockists. Our model uses three parameters to generate predicted margins and assistance which are tested against observed retail parameters to generate insights.

093-0299 Competition Between Nanostores and Supermarkets

Jiwen Ge, Post Doc/Researcher, Tuck School of Business, United States
Brian Tomlin, Professor, Dartmouth College, United States
Jan Fransoo, Professor, Kuehne Logistics University, Germany

Nanostores are small retailers prevalent in the megacities of emerging markets. We build a competition framework where nanostores and a supermarket engage in a retail pricing game and a consumer packaged goods manufacturer engages with the two retail formats in two separate wholesale pricing games.

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Saturday, 09:45 AM - 11:15 AM, Cabinet Track: Sustainable Operations

Invited Session: Blockchain Technology, Supply Chains and Sustainability

Chair(s): Niyazi Taneri Xi Chen

093-0694 Tracing Quality to its Source: Supply Chain Management in the Age of Blockchain

Philippe Blaettchen, Student, INSEAD, France
Andre Calmon, Assistant Professor, INSEAD, France
Sameer Hasija, Associate Professor, INSEAD, Singapore

Modern traceability systems enable unprecedented levels of visibility into supply chains. It is unclear, however, under which conditions these technologies are adopted. We consider the adoption process of a traceability system as a game between supply chain members with a focus on the differences between blockchains and traditional technologies.

093-0710 Technology Investment and Market for Emissions in the Maritime Industry

Franz Buchmann, Student, Copenhagen Business School, Denmark
Leonardo Santiago, Associate Professor, Copenhagen Business School, Denmark

The maritime industry is striving to reduce greenhouse gas emissions. We focus on the problem of investing in new technologies to reduce abatement costs, which are incurred when adjusting to new regulations. We discuss the optimal path of investment and the impact uncertainty creates, when licenses are allocated ex ante.

093-0756 A Permissioned Blockchain Business Model for Green Sourcing

Saif Benjaafar, Professor, University of Minnesota, United States
Xi Chen, Assistant Professor, University of Michigan-Dearborn, United States
Niyazi Taneri, Assistant Professor, National University of Singapore, Singapore
Guangyu Wan, Assistant Professor, Hunan university, China

End-consumers pay substantial price premia for green certified sustainably sourced products. We investigate whether the pairing of a new technology like blockchain with an access-based business model, where users of a technology pay for access rather than make large up-front investments, can alleviate these three information problems.

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Saturday, 09:45 AM - 11:15 AM, Intl Ballroom East Track: Supply Chain Analytics

Invited Session: Demand and Pricing Analytics

Chair(s): Aditya Jain

093-1212 Agricultural Cooperative Pricing of Premium Product

Nur Cavdaroglu, Assistant Professor, kadir has university, turkey, Turkey
Burak Kazaz, Professor, Syracuse University, United States
Scott Webster, Professor, Arizona State University Tempe, United States

We develop two pricing policies for a cooperative to purchase an agricultural product while stimulating the farmer to make quality improvement investments. Using data from a Turkish olive oil industry, we show that these policies coordinate farmer decisions with the system and lead to 10-15% over the current practice.

093-2386 Car Sales Forecasting Research Based On Online Comment Sentiment Analysis

Jia Zhang, Student, School of Economics and Management, Tongji University, China
Yao Chen, Associate Professor, Shanghai University of International Business and Economics, China

We use natural language processing to analyze relevant online comment data, which was obtained by web crawler technology.Our results of empirical research show that online commentary has a significant impact on the sales impact, in which positive emotions have a greater impact on sales than overall emotions and negative emotions.

093-1518 Demand Forecasting for Shipping Using Tree Models with Big Data Settings

XIAOYU YANG, MACHINE LEARNING ENGINEER, SF Technology Ltd. Co., China
Mingjie Zhang, Machine Learning Engineer, SF Technology Ltd. Co., China
ShiJi Qiao, Algorithm Engineer of Operation Research, SF Technology Ltd. Co., China
DONGYAN XU, DATA SCIENTIST, SF Technology Ltd. Co., China
Xiaolong Yao, Director of The Big Data and Block Chain R&D Center, SF Technology Ltd. Co., China

In this paper, we proposed a strategy to forecast package shipping volume using tree models with big data settings. Various features related to both flow directions and product types have been considered. To test our propositions, we examine the model using real world data and achieve over 91% accuracy.

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Saturday, 11:30 AM - 01:00 PM, Piscataway Track: Energy Supply Chains

Invited Session: Renewable energy procurement and energy storage operations

Chair(s): Yangfang Zhou

093-0260 Design of Power Purchase Agreements with Renewable Power Producers

Nur Sunar, Assistant Professor, Kenan-Flagler Business School, United States
John Birge, Professor, University of Chicago, United States

Utilities and Fortune 500 Companies are increasingly signing power purchase agreements (PPA) to meet their demand. In this research, we identify the optimal design of PPAs and the renewable capacity addition in equilibrium.

093-1276 Meeting Corporate Renewable Energy Targets

Danial Mohseni Taheri, Student, University of Illinois at Chicago, United States
Selva Nadarajah, Assistant Professor, University of Illinois at Chicago, United States
Alessio Trivella, Student, Denmark Technical University, Denmark

Several companies have entered power purchase agreements (PPAs) to procure a percentage of future power demand from renewable sources, but research of this practice is lacking. We study procurement portfolios containing PPAs and short-term purchases by tackling two-stage and multi-stage models via analysis and a novel rolling planning approach, respectively.

093-1686 Electricity Generation with Forward Contract Under Renewable Portfolio Standards

Shanshan Guo, Assistant Professor, Shanghai Univ. of Finance and Economics, China
Mahesh Nagarajan, Professor, Sauder School of Business, UBC, Canada
Wenbin Wang, Associate Professor, Shanghai Univ. of Finance and Economics, China

We consider a game between utility firms who sell electricity and trade renewable energy certificate (REC) for profit under the Renewable Portfolio Standard. We derive the optimal capacity and production equilibrium and study how they are affected by the presence of forward contracts for trading REC.

093-1557 Behind-the-Meter Energy Storage Management in the Commercial Sector

Yangfang Zhou, Assistant Professor, Singapore Management University, Singapore
Qing Li, Professor, HKUST, Hong Kong

We consider the management of behind-the-meter energy storage in the commercial sector (such as a retail store or a hospital) with distributed renewable energy generation. We model the problem as a Markov decision process and characterize the optimal storage management policy and derive structural properties.

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Saturday, 11:30 AM - 01:00 PM, Oak Lawn Track: Marketing and Operations Management

Invited Session: Marketing and Operations Management: Competition and Cooperation

Chair(s): Jingming Pan

093-0562 Contagion and Competitive Effects of the Capacity Expansion in China

Yinping Mu, Professor, University of Electronic Science and Technology of China, China
Xinrui Zhan, Student, University of Electronic Science and Technology of China, China
Vinod Singhal, Professor, Georgia Institute of Technology, United States

Based on the capacity expansion announcements in China and the event study methodology, we studied the contagion and competitive effects in the industry level. The market reaction to capacity expansion announcements is examined. The contagion and competitive effects are also examined.

093-0833 R&D Incentives Under Vertical and Horizontal Competitive Pressures

Wei Yan, Associate Professor, University of Electronic Science and Technology of China, China
Yan Song, Professor, Uestc, China
Youwei Li, Professor, Hull University Business School, United Kingdom
HuaYuan Cao, Student, Uestc, China

We develop a model that accounts for both types of competitive pressure simultaneously. Our results reveal that vertical rivalry reduces manufacturers' R&D incentives, while horizontal competition stimulates it. We then tested our models using data from the Chinese computer and electronics industry and found strong empirical support for our predictions.

093-0974 How Does the Power Asymmetry and Relationship Length Impact Social Responsibility of Supply Chain?

Zhi Cao, Student, University of Electronic Science and Technology of China, China
Yinping Mu, Professor, University of Electronic Science and Technology of China, China

We empirically investigated the effects of the power asymmetry and relationship length among supply chain partners on supplier's socially responsible practices based on the data collecting from manufacturing industry in China, and considered the moderate effects of physical distance, high-tech industry, and state ownership.

093-1209 A Game-Theoretic Analysis on the Interactions Between Sharing Economy Platforms and Their Incumbents

Fei Ye, Student, University of Electronic Science and Technology of China, China
Debing Ni, Professor, University of Electronic Science and Technology of China, China

We build a two-period game model to capture the strategic interactions between an incumbent and a sharing economy platform. We identify conditions for the platform to enter and show the impacts of the product's characteristics and consumers' sharing utility on the profitability of the platform and the incumbent.

Saturday, 11:30 AM - 01:00 PM

231 Saturday, 11:30 AM - 01:00 PM, Northwest — Track: Operations and Sports Management

Contributed Session: Sports Analytics and Performance

Chair(s): Justin Kistler

093-1708 The Multi-League Scheduling Problem with Pairing Constraints

Panagiotis Repoussis, Assistant Professor, Stevens Institute of Technology, United States
Walter Gisler, Head of Optimization Department, GotSoccer LLC, United States

League scheduling problems are notoriously hard to solve. This work focuses on rich multi-league scheduling problems with cross-league pairing constraints and a variety of conflicting requirements (e.g. fairness, police requests, minimize travelling, competitiveness and availability of venues). An Iterated Local Search is proposed that employs a sophisticated ruin-and-recreat perturbation mechanism.

093-2172 Automatic Event Detection in Basketball Using Hidden Markov Models

Min-hwan Oh, Student, Columbia University, United States
Suraj Keshri, Student, Columbia University, United States
Garud Iyengar, Professor, Columbia University, United States

We propose a framework for automatically labeling play events in basketball games, using the optical player tracking data. We learn the time series of defensive assignments using a player and location dependent attraction model. Then, we learn to detect events such as ball screens, drives and post-ups without any labels.

093-0499 The Impact of Information Availability on Baseball Player Performance

Justin Kistler, Student, University of South Carolina, United States
Stacey Mumbower, Assistant Professor, University of South Carolina, United States
Joel Wooten, Assistant Professor, University of South Carolina, United States

Leveraging advanced tracking software, we conducted a randomized field experiment on a collegiate baseball team. Players in the treatment group received data visualizations on individual performance following each game, while the control group received traditional box score data. Post-experimental analysis compares the performance improvement in each group.

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232 Saturday, 11:30 AM - 01:00 PM, Morgan — Track: Public Sector Operations Management

Invited Session: Operations Models for Social Good

Chair(s): Kayse Maass

093-1917 Interactive Modeling to Support Criminal Justice-Mental Health Collaboration for People with Serious Mental Illnesses

Kristen Hassmiller Lich, Associate Professor, University of North Carolina Chapel Hill, United States
Sidd Nambiar, Student, North Carolina State University, United States
Elizabeth Sinclair, Director of Research, Treatment Advocacy Center, United States
Tim Coffey, Coordinator, Criminal Mental Health Project, Eleventh Judicial Circuit Court, United States
Isabella Alder, Student, University of North Carolina Chapel Hill, United States

Nationally, the movement to deinstitutionalize care for individuals with serious mental illnesses decreased capacity for hospital-based care without building the requisite community-based services, with consequences for emergency departments, jails, and communities. We present our participatory systems mapping and simulation modeling work with stakeholders to improve cross-system collaboration and decision-making.

093-2013 Placement Optimization in Refugee Resettlement

Andrew Trapp, Associate Professor, Worcester Polytechnic Institute, United States
Alexander Teytelboym, Associate Professor, University of Oxford, Great Britain
Alessandro Martinello, Senior Lecturer, Lund University, Sweden
Tommy Andersson, Professor, Lund University, Sweden
Narges Ahani, Student, Worcester Polytechnic Institute, United States

Thousands of refugees are resettled annually to many countries. Evidence suggests that initial placement profoundly affects lifetime outcomes. We integrate machine learning and integer optimization into an interactive tool that recommends refugee-location placements by optimizing for employment outcomes and allows decision-makers to fine-tune recommendations. Counterfactual employment outcome improvement is 22%-37%.

093-2014 Designing Robust, Efficient, and Fair Gatekeeper Training Interventions for Suicide Prevention

Aida Rahmattalabi, Student, University of Southern California, United States
Phebe Vayanos, Assistant Professor, University of Southern California, United States
Anthony Fulginiti, Assistant Professor, University of Denver, United States
Milind Tambe, Professor, University of Southern California, United States

We consider the problem of selecting “gatekeepers” to train as monitors capable of recognizing warning signs of suicide among their friends. We propose a flexible robust optimization approach capturing uncertainty in gatekeeper performance, incorporating fairness constraints, and scalable to realistic size problems. We showcase performance on real social networks.

093-0501 A Broader Perspective: Integrating Societal Factors into Human Trafficking Shelter Location Models

Kayse Maass, Assistant Professor, Northeastern University, United States
Andrew Trapp, Associate Professor, Worcester Polytechnic Institute, United States
Renata Konrad, Assistant Professor, Worcester Polytechnic Institute, United States

Rehabilitative shelters play a critical role in the safety and long-term recovery of human trafficking survivors. We develop a budget-constrained optimization model that maximizes the societal value of locating additional shelters, discuss methods for quantifying societal factors affecting the placement of shelters, and present computational insights of our study.

Saturday, 11:30 AM - 01:00 PM

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Saturday, 11:30 AM - 01:00 PM, Kalorama Track: Emerging Topics in Operations Management

Invited Session: 3D Printing/Additive Manufacturing-Enabled Operations

Chair(s): Bin Hu

093-0395 The Impact of 3D Printing on Manufacturer-Retailer Contractual Relationships

Mohammad Arbabian, Student, University of Washington, United States
Michael Wagner, Professor, University of Washington, United States

Recently, 3D printing is recognized as a new technology in manufacturing. We focus on a wholesale-price contract where, on top of the traditional manufacturing, either the manufacturer or the retailer could adopt this new technology to produce final products. We analyze the equilibrium of the resulting games.

093-1115 Investigating the Impacts of 3D Printing Implementation on Operations and Business Performance: An Empirical Study

Di Li, Lecturer, Birmingham City University, United Kingdom
John Bancroft, Senior Lecturer, Oxford Brookes University, United Kingdom
Mark Gilman, Professor, Birmingham City University, United Kingdom
Xinyu Kang, Student, The University of Warwick, United Kingdom
Yucheng Zhang, Student, The University of Warwick, United Kingdom

3D Printing has been widely implemented in manufacturing. However, the extant research lacks investigation of the impacts of this implementation from an empirical perspective. This research aims to reveal how 3D printing implementation affects business performance and further explores how this impact could be moderated by internal and/or external business environments.

093-1977 3D Printing in Spare Parts Logistics

Andrei Sleptchenko, Assistant Professor, Khalifa University, United Arab Emirates

This paper studies the advantages of using Traditional Manufacturing (TM), Additive Manufacturing (AM) or a mix of both for replenishment of spare parts inventories. AM offers short lead times, however, at higher production costs, while TM offers a higher degree of reliability, at the expense of longer lead times.

093-0133 Managing Self-Replicating Innovative Goods

Bin Hu, Associate Professor, Naveen Jindal School of Management, United States
Zhankun Sun, Assistant Professor, City University of Hong Kong, Hong Kong

Inspired by a start-up company that markets 3D printers, we investigate the optimal replication and sales policies in the self-replication business model for innovative goods. We analyze a continuous-time optimal control model to identify two distinct regimes wherein either replication or sale takes priority and fully characterize optimal policies.

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Saturday, 11:30 AM - 01:00 PM, Jay Track: Global Supply Chain Management

Invited Session: Global Supply Chain and Operations Management

Chair(s): Xinyan Cao

093-0944 Small Lending Big: Strategic Pricing Games in Online Supply Chain Finance

Nina Yan, Professor, Central University of Finance and Economics, China
Yang Liu, Student, ????, China
Xun Xu, Assistant Professor, California State University Stanislaus, United States

This study examines pricing strategy for capital-constrained suppliers with dual-channel and online SCF. We compare equilibrium prices and quantities when a supplier competes with e-retailer horizontally or vertically. We find that providing online SCF is a value-added service, and participating in vertical competition can help the e-retailer seize the first-mover advantage.

093-1435 Group Buying with Option of Advance Selling and Presence of Consumers' Social Impact

Yanni Ping, Assistant Professor, St. Johns University, United States
Wenjing Shen, Associate Professor, Drexel University, United States

This paper integrates group buying with an option of advance selling to explore how these two innovative selling strategies interacted with each other under a dynamic framework. Strategic consumer behavior is considered and incorporated into the design of the retailer's selling strategy.

093-1452 The Influence of Host National Strategy on Strategic Supply Chain Partner Engagement

Remi Charpin, Assistant Professor, Hec Montreal, Canada
Erin Powell, Assistant Professor, Clemson University, United States
Aleda Roth, Professor, Clemson University, United States

In light of recent global developments, political risk has become a major concern for firms with operations in a host country. We use a qualitative approach to empirically examine when and how China's national policies towards foreign entities influence western firms' subsidiaries engagement with their strategic supply chain partner.

093-1927 Optimal Procurement Design for a National Brand Supplier in the Presence of Store Brand

Xinyan Cao, Assistant Professor, Northern Illinois University, United States
Xiang Fang, Associate Professor, University of Wisconsin Milwaukee, United States
Guang Xiao, Student, Hong Kong Polytechnic Univ, Hong Kong
Nan Yang, Professor, University of Miami, United States

We analyze a supply chain that consists of a supplier and a retailer who holds private information of the store brand product. We derive the equilibrium profits and examine the value of information to the supply chain members.

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Saturday, 11:30 AM - 01:00 PM, Holmead West — Track: Finance and Operations Management

Invited Session: Supply Chain Finance III

Chair(s): Gangshu Cai

093-0653 Does Crowdfunding Benefit Entrepreneurs and Venture Capital Investors?

Volodymyr Babich, Associate Professor, Georgetown University, United States
Simone Marinesi, Assistant Professor, University of Pennsylvania, United States
Gerry Tsoukalas, Assistant Professor, University of Pennsylvania, United States

We study how crowdfunding interacts with traditional financing sources. Economic value of crowdfunding is generally shared between entrepreneurs and investors. Crowdfunding can also alleviate underinvestment due to financial frictions. However, crowdfunding can also harm the entrepreneur and the VC. The model provides a theoretical underpinning for recent empirical observations.

093-0072 Predicting the Release Price of Fine Wines

Mert Hakan Hekimoglu, Assistant Professor, Rensselaer Polytechnic Institute, United States
Burak Kazaz, Professor, Syracuse University, United States

We develop a prediction model for the release price of fine wines using weather, market, and expert reviews. Our study provides guidance to winemakers in determining the release price and tells buyers how to plan their purchasing activities. With our predictions, we demonstrate that buyers can make effective purchasing arrangements.

093-2031 Sustaining Rainforests and Smallholders by Eliminating Payment Delay in a Commodity Supply Chain

Joann de Zegher, Assistant Professor, MIT, United States
Dan Iancu, Associate Professor, Stanford University, United States
Erica Plambeck, Professor, Stanford University, United States

We study the financial and environmental consequences of reducing payment delays for smallholder farmers who are producing agricultural commodities. Motivated by field research in Indonesia, we show how this intervention -- combined with a suitable forest protection requirement -- has the potential of improving likelihoods and reducing illegal deforestation.

093-0186 Blockchain in Taxation - Can Blockhain Transform the Process of Taxation Entirely?

Zoltán Hima, Student, Szechenyi Istvan University, Hungary

Blockchain solutions are close on the banking and insurance sectors, but tax areas are still waiting for a breakthrough. What are the supporting and hindering factors of the breakthrough? What kind of added value does the blockchain generate in the taxation process?

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Saturday, 11:30 AM - 01:00 PM, Gunston East — Track: Purchasing and Supplier Management

Contributed Session: Purchasing strategies

Chair(s): Stephan Wagner

093-0343 Procurement Strategies in Humanitarian Healthcare

Stephan Wagner, Professor, Swiss Federal Institute of Technology Zurich, Switzerland
Bublu Thakur-Weigold, Senior Lecturer, Swiss Federal Institute of Technology Zurich, Switzerland

A humanitarian organization which delivers healthcare services through three supply chains: ongoing missions with relatively stable demand, urgent or emergency relief which involve sudden surge capacity, and special therapeutic programs with highly specific requirements. We analyze procurement strategies and spend and supplier performance data to measure levels of demand-supply matching.

093-1848 How Large Organizations Can Use Accelerator Programs to Facilitate Supplier Innovation

Timothy Breitbach, Assistant Professor, Air Force Institute of Technology, United States
Zach Zacharia, Associate Professor, Lehigh University, United States
Benjamin Hazen, Assistant Professor, Air Force Institute of Technology, United States
Saif Mir, Assistant Professor, College of Charleston, United States

This research investigates how large organizations can drive supplier innovation using accelerator programs. Additionally, it seeks to understand how these organizations can overcome the challenge of adopting and integrating new products and solutions into their operations. The Department of Defense's use of accelerator programs provides the case for this study.

093-2291 Focusing the Imbalance of Supply and Demand of Skills on the Job Market for Purchasers

Klaas Stek, Post Doc/Researcher, University of Twente, Netherlands
Sigrid Weller, Student, Graz University of Technology, Austria
Bernd Markus Zunk, Associate Professor, Graz University of Technology, Austria

Job advertisements of firms put emphasis on both hard and soft skills while universities mostly focus on teaching hard skills. This research reveals a substantial soft skills gap through an updated comparison of the purchasing and supply management requirements in international job advertisements and the learning objectives at universities.

093-0282 Contextual and Methodological Moderators of the Relation Between Supplier Integration and Firm Performance

Carolee Rigsbee, Assistant Professor, University of Illinois at Springfield, United States
Francois Giraud-Carrier, Assistant Professor, Weber State University, United States
Hamed Qahri Saremi, Assistant Professor, Depaul University, United States

Previous research suggests an overall positive effect of supplier integration on firm performance, but reveals the presence of contingencies. We study the effect of eight theoretically derived contextual and methodological moderators of the relation between supplier integration and firm performance in a comprehensive meta-analytic study.

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Saturday, 11:30 AM - 01:00 PM, Gunston West Track: Next Generation Operations

Contributed Session: 3D Printing and Capacity Management

Chair(s): Nathan Kunz

093-0705 Prescriptive Analytics for Two-Stage Capacity Planning with Upgrading

Pascal Notz, Student, University of Wuerzburg, Germany

We present a data-driven prescriptive approach for two-stage capacity planning with upgrading based on empirical risk minimization and kernelization. We characterize the approach by deriving out-of-sample guarantees and evaluate the performance numerically in comparison with several benchmark approaches using the real-world dataset of a logistics service provider.

093-1319 The Influence of Additive Manufacturing on Make-to-Order Companies: A Production Planning and Control Perspective

Yuan Huang, Lecturer, Cardiff Business School, United Kingdom
Daniel Eyers, Lecturer, Cardiff Business School, United Kingdom
Mark Stevenson, Professor, Lancaster University, United Kingdom

This paper investigates the application of Additive Manufacturing on make-to-order companies offering low-volume high-variety products. A framework on how Additive Manufacturing influences make-to-order manufacturing processes, production planning and control decisions, and competitive advantage is proposed through empirical research that unifies the state-of-the-art in Additive Manufacturing with conventional make-to-order challenges.

093-1270 3D Printing as Disruptive Innovator in the Mobile Phone Supply Chain

Nathan Kunz, Assistant Professor, University of North Florida, United States
Ahmad Beltagui, Lecturer, Aston University Birmingham, United Kingdom
Stefan Gold, Professor, University of Kassel, Germany

3D printing technologies enable consumers to contribute to production which can compel producers to alter their supply chains. This research tests whether and how a new entrant can disseminate social responsibility in the mobile phone supply chain, using 3D printing to overcome size related resource constraints.

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Saturday, 11:30 AM - 01:00 PM, Fairchild East Track: POM in Practice

Invited Session: Practice-based inventory and maintenance research

Chair(s): Geert-Jan Van Houtum

093-0213 Improved Spare Part Inventory Management Using Service Maintenance Information

Sarah Van der Auweraer, Student, KU Leuven, Belgium
Robert Boute, Associate Professor, KU Leuven, Belgium

We improve the inventory management of critical spare parts that are used for service maintenance. We make stocking decisions using information on the maintenance policy, the installed base of the part, and its failure behaviour. The research is motivated by and conducted in close cooperation with an Original Equipment Manufacturer.

093-0399 Optimal Processing of Donor Human Milk to Meet Production Targets

Lisa Maillart, Professor, University of Pittsburgh, United States

We optimize the processing of donor human milk, including the pooling of milk across donors, batching pooled milk, and assigning batches to pasteurizers. Numerical results demonstrate a significant improvement in pooling outcomes and production utility compared to former practice at Mothers' Milk Bank of North Texas.

093-2097 Development of a Smartphone App to Improve the Management of Realibility Centered Maintenance.

Rafaela Aguiar, Student, Federal University of Juiz-de-Fora, Brazil
Luiz Alves, Professor, Universidade Federal De Juiz De Fora, Brazil
Victor Aguiar, Student, Federal University of Juiz-de-Fora, Brazil

This paper presents the development and application of a Smartphone App for improving performance of maintenance management focused on RCM. The results of its use after application in two Brazilian companies demonstrated excellent improvement in maintenance performance.

093-0184 Printing Spare Parts at Remote Locations: Fulfilling the Promise of Additive Manufacturing

Geert-Jan Van Houtum, Professor, Eindhoven University of Technology, Netherlands
Bram Westerweel, Student, Eindhoven University of Technology, Netherlands
Rob Basten, Associate Professor, Eindhoven University of Technology, Netherlands

We show that 3D printing of spare parts can be beneficial at missions of the Royal Netherlands Army. These parts can temporarily replace critical components in technical systems to bridge the time between the next replenishment. The problem is modeled as a dual sourcing inventory problem.

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Saturday, 11:30 AM - 01:00 PM, Fairchild West Track: Economics Models in Operations Management

Invited Session: Emerging Topics in OM-Economics Interface

Chair(s): Somya Singhvi Yanchong Zheng

093-0382 Operational Transparency for Digital Employees

Jorge Mejia, Assistant Professor, Indiana University, United States
Chris Parker, Assistant Professor, Penn State University University Park, United States

Operational transparency has been shown to improve consumer-facing outcomes. We explore whether providing operational transparency to online employees impacts work quality. We find that disruptions to an online job system result in significantly worse job performance, but that providing operational transparency can remove the negative impacts.

093-0565 Online-to-Offline Platform Models

Xu Joseph (Jiaqi), Assistant Professor, Carnegie Mellon University, United States
Hui Li, Assistant Professor, Tepper School of Business, Carnegie Mellon University, United States
Sridhar Tayur, Professor, Carnegie Mellon University, United States

We study commonly observed business models for online-to-offline (O2O) platforms. We derive optimal strategies and equilibrium outcomes to understand: how the models function, how best to avoid incentive misalignment and system loss, which model is better for the platform, the merchant, the system, and under what market conditions.

093-1282 Disruptions, Resilience and Performance of Emerging Market Entrepreneurs: Evidence from Uganda

Amrita Kundu, Student, London Business School, United Kingdom
Kamalini Ramdas, Professor, London Business School, United Kingdom
Stephen Anderson-Macdonald, Assistant Professor, Stanford University, United States

We examine the effect of firm-specific business disruptions (both managerial and operational) on the performance of small firms in emerging markets and the effectiveness of appropriate resilience strategies in buffering against these disruptions, using a hand-built panel dataset on 646 small firms over four time periods in Kampala, Uganda.

093-1096 Can Online Auctions Increase Farmers' Revenue? Evidence from Agricultural Markets in India

Retsef Levi, Professor, MIT, United States
Somya Singhvi, Student, Massachusetts Institute of Technology, United States
Yanchong Zheng, Associate Professor, Massachusetts Institute of Technology, United States

The government of Karnataka in India started integrating all its regulated markets through an online platform in 2014. In this work, we examine the impact of this platform on wholesale prices of commodities using a quasi-experimental approach. Our results suggest that investing in transparency can substantially improve farmer revenue.

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Saturday, 11:30 AM - 01:00 PM, Embassy Track: Retail Operations

Invited Session: Retail Supply Chain

Chair(s): Ruomeng Cui Meng Li

093-0232 The Benefits of Un-Pooling Logistics Resources: An Empirical Study

Yifan Feng, Student, University of Chicago, United States
Rene Caldentey, Professor, University of Chicago, United States
Linwei Xin, Assistant Professor, University of Chicago, United States

We study the effect of logistics resources on service performance. We show empirically that operating dedicated resources can reduce orders' delivery times, an effect that is more significant during peak days. Thus the operational principle of resource pooling is not necessarily beneficial in the context of a logistics system.

093-2132 Online Inventory Disclosure: The Impact of How Consumers Perceive Information

Tolga Aydinliyim, Associate 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 apriori (stochastic) beliefs regarding inventory.

093-1657 The Impact of Urban and Rural Customer Preferences for Logistics Services on E-Grocery Logistics Operations

Martin Waitz, Post Doc/Researcher, WU Vienna University of Economics and Business, Austria
Andreas Mild, Associate Professor, WU Vienna University of Economics and Business, Austria
Christian Fikar, Post Doc/Researcher, WU Vienna University of Economics and Business, Austria

Preferences for different e-grocery logistics services (e.g. delivery fee, delivery day) of Austrian customers have been derived by conducting two surveys, including conjoint studies. Based on these results, an agent-based simulation optimization decision support system has been developed to show the implications of a grocer's logistics operations.

093-0873 Wholesale Price Discrimination in Global Sourcing: Field Evidence from Alibaba

Ruomeng Cui, Assistant Professor, Emory University, United States
Jingyun (Jenny) Li, Assistant Professor, California State University Stanislaus, United States
Meng Li, Assistant Professor, Rutgers University, United States
Lili Yu, Student, University of Science and Technology of China, China

There is limited study on suppliers' price-quoting behaviors and price discrimination in business-to-business (B2B) markets. In this research, we investigate whether wholesale price discrimination exists by conducting randomized field experiments on Alibaba.com, the world's largest online global -trade platform.

Saturday, 11:30 AM - 01:00 PM

242 Saturday, 11:30 AM - 01:00 PM, Du Pont Track: Revenue Management and Pricing

Invited Session: Innovative Revenue Management Applications

Chair(s): Pelin Pekgun Ovunc Yilmaz

093-0409 Dynamic Management of Opaque Selling When Consumers are Boundedly Rational

Zhe Yin, Assistant Professor, Shanghai University, China
Tingliang Huang, Associate Professor, Boston College, United States

We study a practically important problem for opaque selling: How should a firm dynamically adjust the price and product offering probability with boundedly rational customers? We characterize the optimal selling policies depending on the profitability of each component product and customers' sample source for anecdotal reasoning.

093-0564 Dynamic Capacity Allocation for Group Bookings in Live Entertainment

Kyle Maclean, Assistant Professor, University of Western Ontario, Canada
Fredrik Odegaard, Assistant Professor, University of Western Ontario, Canada

A persistent problem within live entertainment is lost revenue due to sparsely stranded single seats. To solve this operational problem we formulate and study a capacity based revenue management control problem that explicitly accounts for group size and customer choice.

093-0593 How to Play Fantasy Sports Strategically (and Win)

Martin Haugh, Associate Professor, Imperial College London, United Kingdom
Raghav Singal, Student, Columbia University, United States

We provide a coherent framework for constructing Daily Fantasy Sports (DFS) portfolios where we explicitly model the behavior of other DFS players. In addition to demonstrating the value of our framework by participating in DFS contests, we estimate the value of "insider trading" and "collusion".

093-1995 Airline Pricing for Mega Sports Events with Price-Freeze Options

Ovunc Yilmaz, Assistant Professor, University of Notre Dame, United States
Xiyuan Ge, Student, University of Washington, United States
Daewon Sun, Professor, University of Notre Dame, United States

We investigate the optimal pricing policy for an airline serving a market which hosts a mega sports event (e.g., The Super Bowl) and discuss scenarios where offering price-freeze options (e.g., FareLock) can be beneficial.

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243 Saturday, 11:30 AM - 01:00 PM, Cardozo Track: Data Science

Invited Session: Tutorial: Data-Driven Decision Making in JD.COM's Supply Chain

Chair(s): Deng Ge Rong Yuan

093-1714 Data-Driven Decision Making in JD.COM's Supply Chain

DENG GE, Research Scientist, JD.COM, United States
Di Wu, Principal Scientist, JD.COM Sillicon Valley R&D Center, United States
Rong Yuan, Research Scientist, JD.COM Sillicon Valley R&D Center, United States
Max Shen, Professor, University of California Berkeley, United States

JD.COM is one of the largest e-commerce retailers in China. In this talk, we will demonstrate how we implement data-driven techniques such as machine learning and optimization in JD.COM's supply chain. The decision making areas include demand forecast, product assortment, inventory management, and network planning.

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244 Saturday, 11:30 AM - 01:00 PM, Coats Track: Manufacturing Operations

Invited Session: Operations Management on Service-oriented Manufacturing

Chair(s): Hongguang Bo Chunliu Zhou

093-1140 Research on Two-Side Matching Decision-Making Method for Logistics Service Based on Information Axiom

Lingrong Zhang, Associate Professor, Dalian University of Technology, China

A method for the problem of two-side matching between logistics service suppliers and demanders based on information axiom with the desired and actual levels is proposed. Taking the expected information and the actual information of both sides into consideration, a multi-index two-side matching model is established.

093-1248 Blockchain Technologies for Service-Oriented Manufacturing Applications

Hong-Guang Bo, Associate Professor, Dalian University of Technology, China
Huilin Zhang, Student, Dalian University of Technology, China
Chunliu Zhou, Student, Dalian University of Technology, China

Services like maintenance, repair, and overhaul (MRO) for complex products are increasingly considered in traditional manufacturing enterprises to enhance their competitiveness. To reduce negative effects of current issues like data inconsistency, a service management system and an example are explored to illustrate the application of blockchain technologies in service-oriented manufacturing.

093-1709 MRO Configuration Management for Complex Long-life Products - A Case Study

Chunliu Zhou, Student, Dalian University of Technology, United States
Xiaobing Liu, Professor, Dalian University of Technology, China
Lian Qi, Associate Professor, Rutgers University, United States
Hongguang Bo, Associate Professor, Dalian University of Technology, China

MRO activities make product data under continuous changes. How to maintain data continuity and consistency is important for efficient MRO activities. This paper explores the application possibility of configuration management (CM) in MRO process and builds a MRO CM framework with a case study of high-speed trains.

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Saturday, 11:30 AM - 01:00 PM, Columbia 1 Track: Scheduling and Logistics

Contributed Session: Dispatching and Scheduling in Production and Service Systems

Chair(s): Jiung Lee

093-1300 Computational Strategies for Stochastic Programming for Integrated Scheduling and Procurement Problems Involving Endogenous Uncertain Parameters

Yue Sha, Student, Tsinghua University, China
Hui Cao, Associate Professor, Tsinghua University, China

We study a combined optimization problem of job scheduling and material replenishment in the customized manufacturing process. To develop real-time schedules, we propose a multistage stochastic programming model involving endogenous uncertain parameters. A set of theoretical reduction properties and an approximate solution approach are proposed to tackle the curse of dimensionality.

093-1850 An MILP Formulation for the Flowshop Lot Streaming Problem

Anurag Agarwal, Professor, University of South Florida, United States
Ramakrishna Govindu, Senior Lecturer, University of South Florida, United States

In this paper we propose an MILP formulation for the flowshop lot streaming problem. We compare results of the MILP approach with the Heuristic approach.

093-0422 Simulation Modeling of Real-Time Scheduling of Building Elevator Systems

Godwin T, Professor, IIM Tiruchirappalli, India

Real-time scheduling alternatives for single and multiple building elevator systems are evaluated for minimizing a person's waiting time for an elevator and the time spent in the elevator. The arrivals follow time-varying statistical distribution. A simulation modeling approach is used to evaluate the elevator scheduling alternatives.

093-0958 Service Zone Design of Elevators in a High-Rise

Jiung Lee, Student, University of California Berkeley, United States
Zuo-Jun Max Shen, Professor, University of California Berkeley, United States

We study efficient designs for an elevator dispatching system in a high-rise. Given an up-peak traffic pattern of customers in morning rush hours, we analyze performance of different zoning configurations of the elevators paired with dispatching policies, and propose efficient designs of the system.

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Saturday, 11:30 AM - 01:00 PM, Columbia 2 Track: Operational Excellence

Invited Session: Tutorial: On the OM approach to errors: What can we learn from an organizational research lens?

Chair(s): Eitan Naveh

093-2397 The OM Approach to Errors: What Can We Learn From Organizational Research?

Eitan Naveh, Associate Professor, Technion, Israel
Zhike Lei, Professor, Pepperdine University, United States

The nature and underpinnings of errors in organizations address an important problem space, but one that often does not get a substantial amount of conceptual attention in the OM literature. We will present an integrative approach to errors that combines errors coping strategies of OM methodologies together with organizational research

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Saturday, 11:30 AM - 01:00 PM, Columbia 3 Track: Service Operations

Invited Session: Competition Finalists: Most Influential Service Operations Paper

Chair(s): Enrico Secchi

093-2459 Optimal Retail Return Policies with Wardrobing

Guangzhi Shang, Assistant Professor, Florida State University, United States
Bikram Ghosh, Associate Professor, University of Arizona, United States
Michael Galbreth, Professor, University of Tennessee Knoxville, United States

Published in Production and Operations Management, Vol. 26, No. 7, July 2017, pp. 1315-1332

093-2461 Surprise, Anticipation, and Sequence Effects in the Design of Experiential Services

Mike Dixon, Assistant Professor, Utah State Univ, United States
Liana Victorino, Associate Professor, University of Victoria, Canada
Robert Kwortnik , Associate Professor, Cornell University, United States
Rohit Verma, Professor, Cornell University, United States

Published in Production and Operations Management, Vol. 26, No. 5, May 2017, pp. 945-960

093-2460 Benefits of Surgical Smoothing and Spare Capacity: An Econometric Analysis of Patient Flow

Diwas Kc, Associate Professor, Emory University, United States
Christian Terwiesch, Professor, The Wharton School, United States

Published in Production and Operations Management, Vol. 26, No. 9, September 2017, pp. 1663-1684

093-2462 The Boarding Patient: Effects of ICU and Hospital Occupancy Surges on Patient Flow

Elisa Long, Associate Professor, UCLA Anderson School of Management, United States
Kusum Mathews, Student, Yale University, United States

Published in Production and Operations Management, Vol. 27, No. 12, December 2018, pp. 2122-2143

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Saturday, 11:30 AM - 01:00 PM, Columbia 4 Track: Healthcare Analytics

Invited Session: Machine learning and optimization in healthcare

Chair(s): Velibor Misic

093-0933 Predicting treatment toxicity and efficacy in multiple myeloma from entities extracted from Amazon Comprehend Medical

David Coffey, Physician , Fred Hutch Cancer Research Center, United States
Emisa Nategh, Student, University of Washington, United States
Michael Wagner, Professor, Foster School of Business, United States
Yong-Pin Zhou, Professor, University of Washington, United States

The aim of our research is to develop an ML model to match patients to the most effective therapy while minimizing toxicities. We used Amazon Comprehend Medical to extract clinical entities in order to train a model that identifies which clinical features are most informative for predicting toxicity and efficacy.

093-2332 Online Scheduling of Outpatients

Kimia Ghobadi, Assistant Professor, Johns Hopkins University, United States
Michael Hu, Student, MIT, United States
Retsef Levi, Professor, MIT, United States
Cecilia zenteno, Operations Research Manager, MGH, United States

In this talk, we demonstrate the use of online (real-time) intra- and inter-day algorithms to schedule outpatients. This scheduling model improves efficiency by allowing the clinics to treat more patients with fewer resources. We show 30% empirical improvement and theoretical worst-case bounds on the performance of the algorithm.

093-1373 Machine Learning Models for Predicting Surgical Readmissions From EHR Data

Velibor Misic, Assistant Professor, University of California Los Angeles, United States
Kumar Rajaram, Professor, UCLA Anderson School of Management, United States

In this talk, we present machine learning models for predicting surgical readmissions using data from a large academic medical center. Our models provide more accurate predictions sooner than existing methods for surgical readmission risk prediction.

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Saturday, 11:30 AM - 01:00 PM, Columbia 5 Track: Healthcare Operations Management

Invited Session: Improving Coordination in Health Care Delivery

Chair(s): Anita Tucker

093-0878 Antecedents and Consequences of Physician – Patient Communication

David Dobrzykowski, Associate Professor, Bowling Green State University, United States
Monideepa Tarafdar, Professor, Lancaster University, United Kingdom
David Ding, Assistant Professor, Rutgers Business School, United States

We examine Physician-Patient Communication (MDcom), testing two models – one incorporating survey data measuring managers' perceptions about the effects of their hospital's HIT orientation on MDcom and another using secondary data revealing the longitudinal effects of MDcom. Our results reveal how managers can drive MDcom and positive financial performance.

093-1364 Nursing Team Continuity and its Influence on Medical Outcomes: Evidence from a Multicenter Study

Kerstin Eilermann, Student, University of Cologne, Germany
Ludwig Kuntz, Professor, University of Cologne, Germany
Stefan Scholtes, Professor, Cambridge University, United Kingdom

Low staffing levels are known to be a risk factor for medical outcomes. It is, however, important to not only consider nurse-staffing levels, but also structures of staff schedules. Based on data from a multicenter study with 66 NICUs, we analyze the association between nursing team continuity and patient outcomes.

093-1511 The Impact of Primary Care Provider Availability on Patient Care

Hessam Bavafa, Assistant Professor, University of Wisconsin-Madison, United States
Christian Terwiesch, Professor, The Wharton School, United States

Emergency room overcrowding and overuse are significant problems in the United States. A possible reason is that primary care providers are too busy to provide timely appointments. We use a large dataset from the Veterans Health Administration to shed light on this claim.

093-1730 Surge Capacity Deployment in Hospitals: Effectiveness of Response and Mitigation Strategies

Alex Mills, Associate Professor, Baruch College, United States
Jonathan Helm, Assistant Professor, Kelley School of Business, United States
Yu Wang, Student, Indiana University, United States

Recent government regulations in the US require hospitals to take adequate measures to manage surge capacity, the ability to accommodate a sudden increase in demand. We examine response and mitigation strategies that affect surge capacity and show how to determine when they are complements or substitutes.

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Saturday, 11:30 AM - 01:00 PM, Columbia 6 Track: Healthcare Operations Management

Invited Session: Emerging Topics in Healthcare Operations

Chair(s): Zahra Azadi

093-1011 Improving the Inventory of Surgical Instruments via Data Driven Simulation and Optimization Models

Amogh Bhosekar, Student, Clemson University, United States
Tugce Isik, Assistant Professor, Clemson University, United States
Sandra Eksioglu, Associate Professor, Clemson University, United States

This study presents a Just-In-Time modeling framework that leads to improved inventory of surgical instruments in a healthcare facility. Historical data points to low utilization of surgical instruments. We propose data-driven simulation and optimization models to integrate surgery schedules with instrument inventories. Numerical analyses indicate improvements of inventory utilization.

093-2283 Stability Analysis of Supply-Demand Models with Multiple Random Delays

Sara Nourazari, Assistant Professor, California State University Long Beach, United States

Time delays are an inevitable aspect of many supply-demand systems. This study exploits deterministic stability maps to facilitate optimal control design of systems with multiple nondeterministic time-delays. This approach is especially beneficial in healthcare supply-demand management when capacity adjustment delays are not avoidable and generally are stochastic.

093-1611 A Social Network Analysis Application for Enhancing Outpatient Clinical Service - An Indian Healthcare Scenario

Venkataramanaiah Saddikuti, Associate Professor, Indian Institute of Management Lucknow, India
Pesaru Vigneshwar Reddy, Software Engineer, Cypress Semiconductors Corp, India
Mukund Janardhan, Assistant Professor, Leicester University, United Kingdom

This paper focuses on interdisciplinary dependencies and socio-technical aspects that make up the relationships between the doctors, staff, and nurses which, eventually enhances their performance and improves the patient satisfaction in an outpatient setting. This study is based on a questionnaire administered to randomly selected public hospital staff, doctors, nurses, and administrators

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093-0042 Stochastic Optimization Models for Childhood Vaccine Distribution Network: A Case Study in Niger

Zahra Azadi, Assistant Professor, University of Miami Business School, United States
Sandra Eksioglu, Associate Professor, Clemson University, United States

The main objective of this research is to increase vaccine coverage in low income countries by improving performance of the corresponding supply chain. We propose a chance constraint programming model to identify optimal supply chain designs and management strategies. We apply this model to a case study in Niger.

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Saturday, 11:30 AM - 01:00 PM, Columbia 7 Track: Supply Chain Management

Invited Session: SCM Best Student Paper Competition 2

Chair(s): Georgia Perakis

093-2468 The Distribution-free Inventory Problem for E-commerce Fulfillment Networks

Aravind Govindarajan, Student, University of Michigan Ann Arbor, United States
Amitabh Sinha, Principal Scientist, Amazon.com, United States
Joline Uichanco, Assistant Professor, University of Michigan, United States

We consider a distributionally robust model for e-commerce network inventory optimization with reactive recourse, given only the mean and covariance of the demands. We show the problem to be tractable under a special class of fulfillment costs which produces a hierarchy to spillover fulfillment.

093-2469 Learning Personalized Product Recommendations with Customer Disengagement

Hamsa Bastani, Assistant Professor, University of Pennsylvania, United States
Pavithra Harsha, Research Staff Member, IBM, United States
Georgia Perakis, Professor, Massachusetts Institute of Technology, United States
Divya Singhvi, Student, Massachusetts Institute of Technology, United States

We consider the problem of sequential product recommendations when customer preferences are unknown and customers are likely to disengage from the platform. We prove that bandit learning algorithms over-explore and the greedy policy under-explores in this regime. Finally, we propose a new learning algorithm with strong analytical and empirical performance.

093-2470 Joint Pricing and Production : A Fusion of Machine Learning and Robust Optimization

Qinshen Tang, Student, National University of Singapore, Singapore
Georgia Perakis, Professor, Massachusetts Institute of Technology, United States
Melvyn Sim, Professor, National University of Singapore, Singapore
Peng Xiong, Lecturer, National University of Singapore, Singapore

We integrate K-means clustering with robust optimization to address a two-period joint pricing and production problem. We construct a K-means ambiguity set and propose an affine recourse approximation to reformulate it as a MILP. Our framework can increase expected profits by 1.11% on average when applied to most out-of-sample tests

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Saturday, 11:30 AM - 01:00 PM, Columbia 8 Track: Supply Chain Management

Invited Session: Emerging Topics in Supply Chain Management

Chair(s): Xiajun Pan Quan Zheng

093-0177 The Bright Side of the Primary Retail Platform's Control of the Resale Market

Tianxin Zou, Student, Washington University St Louis, United States
Baojun Jiang, Associate Professor, Washington University St Louis, United States

This paper develops an analytical framework to show that, counterintuitively, the primary retail platform's control of the resale market may lead to an all-win outcome, benefiting the platform, the upstream provider, and the consumers. Using data from Ticketmaster.com and StubHub.com, we provide some suggestive empirical support for our theoretical predictions.

093-1703 Implications of Product Substitutability in a Common Retailer Channel

Quan Zheng, Assistant Professor, University of Science and Technology of China, China
Honggang Hu, Student, University of Florida, United States
Xiajun Pan, Assistant Professor, University of Florida, United States

The paper studies the effect of product substitutability on the optimal profits in a common retailer channel. Specifically, we analyze whether the retailer and manufacturers prefer more or less substitutability for settings with different demand functions, number of upstream manufacturers, and bargaining powers between manufacturers and the retailer.

093-0336 To Insure or Not: Return Shipping Insurance Strategy for Online Platforms and Third-Party Retailers

Yiming Li, Student, Xi'An Jiaotong University, China
Gang Li, Professor, Xi'An Jiaotong University, China
Xiajun Pan, Assistant Professor, University of Florida, United States
T.C.E. Cheng, Professor, The Hong Kong Polytechnic University, China

We study Return Shipping Insurance (RSI) strategy for an online platform and two competing third-party retailers selling products through the platform. We find that one or both retailers should adopt the RSI strategy once provided by the platform, depending on RSI characteristics, the differentiation degrees of the products, and retailers.

093-0359 Optimal Pricing for a Dual-Channel Supply Chain in the Presence of Strategic Consumers

Kai Pan, Assistant Professor, The Hong Kong Polytechnic University, Hong Kong

This paper investigates how the presence of strategic consumer behavior affects the interactions among a manufacturer, a retailer, and a forward-looking consumer population, within a dual-channel and two-period supply chain model. The problem we consider is motivated by the increasing difficulties in deciding selling/pricing strategies within the New Retail era.

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Saturday, 11:30 AM - 01:00 PM, Columbia 9 Track: Behavioral Operations Management

Invited Session: Cost Accounting in Queuing and OM Systems

Chair(s): James Fan

093-0912 Wait and See, or Pay Now?

Rob Basten, Associate Professor, Eindhoven University of Technology, Netherlands
Lijia Tan, Post Doc/Researcher, Eindhoven University of Technology, Netherlands

We usually have to make a decision on whether and when to pay a cost to avoid an unexpected loss, such as in the context of machinery maintenance and preventive healthcare. This study addresses this problem in which individuals make such decisions in a degradation process.

093-2147 Performance of Queuing Systems with Strategic Customers and Servers

Hung Do, Assistant Professor, University of Vermont, United States

In this project, I study the impact of strategic behavior of customers and servers on the performance of queuing systems under different queue designs and incentive systems.

093-1305 The Joint Effects of Work Breaks, Fatigue, and Psychological Burnout on Servers' Productivity

Ahmad Ashkanani, Assistant Professor, Kuwait University, Kuwait
Benjamin Dunford, Associate Professor, Purdue University, United States

We examine the joint effects of pre-scheduled work breaks, short-term fatigue, and long-term fatigue (as measured by psychological burnout) on an employee's productivity. We test our hypotheses using multilevel models and longitudinal data from servers in a call center. We find key insights based on the cross-level interactions between the three factors.

093-2409 Social Norms in Customer-Operated Service Systems

Laurens Debo, Associate Professor, Dartmouth College, United States
James Fan, Assistant Professor, Naval Postgraduate School, United States
Chen Jin, Assistant Professor, National University of Singapore, Singapore
Mirko Kremer, Professor, Frankfurt School of Finance & Management, Germany

We study experimentally how social norms evolve in, and affect the performance of, customer-operated service systems, where service times are endogenously determined by the customers. Our data shows that service times are positively serially correlated. We explore several boundary conditions as well as managerial levers to mitigate adverse impacts.

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Saturday, 11:30 AM - 01:00 PM, Columbia 10 Track: Product Innovation and Technology Management

Invited Session: Managing Uncertainty and Incentives in New Product Development

Chair(s): Sreekumar Bhaskaran

093-0671 An Economic Model of Knowledge Outsourcing

Jaeseok Lee, Lecturer, The University of Auckland, New Zealand
Cheryl Gaimon, Professor, 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 distinctive aspects of knowledge outsourcing: absorptive capacity and the ability to leverage prior knowledge. We also investigate how uncertainty and information asymmetry influence the equilibrium outcomes.

093-0768 Competing Innovation Contests

Konstantinos Stouras, Assistant Professor, Michael Smurfit Graduate School of Business, Ireland
Sanjiv Erat, Associate Professor, Rady School of Management, United States
Kenneth Lichtendahl Jr., Assistant Professor, Darden School of Business, United States

We study equilibria among mechanisms chosen by firms that design innovation contests.

093-1361 Process Innovation in Pharmaceutical Industry

Ivan Lugovoi, Student, Hec Paris, France
Dimitrios Andritsos, Assistant Professor, Hec Paris, France
Claire Senot, Assistant Professor, Tulane University, United States

We explore the economic effects of process innovation on pharmaceutical manufacturing. Through a collaboration with expert patent attorneys we construct a unique dataset that: i) evaluates process innovation through a detailed observation of pharmaceutical manufacturers' portfolios of process patents and ii) measures key qualitative dimensions of process innovation.

093-2030 Optimal Incentives and Team Composition for Diverse Collaborative Activities

Svenja Sommer, Associate Professor, Hec Paris, France
Sara Rezaee Vessal, Assistant Professor, Essec Business School, France

We study how firms should adjust team incentives considering three different types of collaboration activities: outcome-improving helping, cost-reducing knowledge sharing, and uncertainty-reducing information sharing. We explore the implications for the team composition, if there is a trade-off between team members' task related abilities, and their collaborative skills.

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Saturday, 11:30 AM - 01:00 PM, Columbia 11 Track: Inventory Management

Invited Session: Advances in Inventory Theory

Chair(s): Houcai Shen

093-1009 Constant-Order Policies for Lost-Sales Inventory Models with Random Supply Functions: Asymptotics and Heuristic

Jinzhi Bu, Student, The Chinese University of Hong Kong, Hong Kong
Xiting Gong, Assistant Professor, The Chinese University of Hong Kong, Hong Kong
Dacheng Yao, Associate Professor, Chinese Academy of Sciences, China

In this paper, we study constant-order policies (COP) for the lost-sales system with positive lead times and random supply. Besides theoretically analyzing asymptotic properties of the best COP with large lead times and large penalty cost, we also construct a simple and near-optimal heuristic COP and conduct extensive numerical studies.

093-1221 Coordinating Inventory and Pricing Strategies Under Total Minimum Commitment Contracts

Xiting Gong, Assistant Professor, The Chinese University of Hong Kong, Hong Kong
Quan Yuan, Associate Professor, Zhejiang University, China
Frank Chen, Professor, City University of Hong Kong, Hong Kong

We study a total minimum commitment contract embedded in a finite-horizon periodic-review inventory with dynamic pricing system. The buyer commits to purchase a minimum quantity over the entire horizon. It maximizes inventory and pricing decisions at the same time. We analyze the structure of optimal policies and propose heuristic policies.

093-1733 Inventory Risk Hedging Strategies in Supply Chains: Contracting and Pricing

Houcai Shen, Professor, Nanjing University, China
Weili Xue, Professor, Southeast University, China

Demand uncertainty causes the risk of supply and demand mismatching. Firms can choose different contracting and pricing strategies to deal with the demand uncertainty. We study the contract and pricing strategy choice of both the supplier and the retailer, considering the whole supply chain.

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Saturday, 11:30 AM - 01:00 PM, Columbia 12 Track: Service Operations

Invited Session: Data-Driven Insights for Service and Retail Operations

Chair(s): Guangzhi Shang

093-0815 Inventory Allocation in a Multichannel Setting Involving Drop-Shipping Operations

Annibal Sodero, Assistant Professor, University of Arkansas - Fayetteville, United States

This study investigates the outcomes of inventory allocation across multiple retail channels by a vendor of fashion products.

093-1288 Can "I" Make "We" Better? An Investigation of Spillover Effects on Grocery Store Check-Out Quality

Hyun Seok (Huck) Lee, Assistant Professor, Oregon State University, United States
Guanyi Lu, Assistant Professor, Florida State University, United States
Junbo Son, Assistant Professor, University of Delaware, United States

Using an operational data set in a grocery store setting, we examine how a cashier's productivity level affects other cashiers' performance. We further extend our analysis to the "team" level and explore if the existence of a "super-star" will produce positive effects on overall team performance.

093-1403 An Empirical Study of the Impact of Specialization, Workload, and Product Personalization on Consumer Returns

Hailong Cui, Student, Marshall School of Business, United States
Raj Rajagopalan, Professor, Marshall School of Business, United States
Amy Ward, Professor, Booth School of Business, United States

We study the impact of key operational levers on return rates, while controlling for numerous factors. We find that increased task specialization helps reduce return rates, but the impact is U-shaped. Increased workload levels in production result in higher return rates, whereas product personalization leads to lower return rates.

093-0200 The Impact of Waiting on Customer Responsiveness in Live-Chat Centers

Noyan Ilk, Assistant Professor, Florida State University, United States
Guangzhi Shang, Assistant Professor, Florida State University, United States

We study the impact of waiting times on customer response behavior in the context of online service centers. Using a unique operational data set, we show that waiting before service (i.e., queue wait) accelerates customer engagement, whereas waiting during service (i.e., in-service wait) slows down customer responses.

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Saturday, 11:30 AM - 01:00 PM, Monroe Track: Humanitarian Operations and Crisis Management

Invited Session: Empirical research in humanitarian operations

Chair(s): Maria Besiou Laura Turrini

093-0487 Resilience to Destructive Leadership: An Empirical Examination of Humanitarian Operations Context

Mojtaba Salem, Student, Kuehne Logistics University, Germany
Maria Besiou, Professor, Kuehne Logistics University, Germany
Niels Van Quaquebeke, Professor, Kuehne Logistics University, Germany

Humanitarians may work under leaders who act aggressively towards them out of the belief that doing so will engender performance. While leadership research suggests this worsens performance, field reports show tough leaders can get the job done. This paper investigates factors that make humanitarian operations context resilient to destructive leadership.

093-0621 Understanding the Concept of Localizing Preparedness Capacity

Lina Nord, Student, Lund University, Sweden
Harwin De Vries, Lecturer, INSEAD, France
Marianne Jahre, Professor, BI Norwegian Business School, Norway
Joakim Kembro, Assistant Professor, Lund University, Sweden
Luk Van Wassenhove, Professor, INSEAD, France

In the humanitarian community, focus is now shifting from global to local operations in preparing for disasters. We present a framework for this localization process of preparedness capacities including a suggested definition of localization and discuss its implications for humanitarian organizations and logisticians for the future.

093-1420 Humanitarian Organizational Design and Information Flow

Lauren Bateman, Student, George Washington University, United States
Erica Gralla, Assistant Professor, George Washington University, United States

We examine how humanitarian organizations are designed to enable information flow and how their design varies for different types of responses. Specifically, we compare two different IFRC responses to begin to identify common patterns and differences across disasters.

093-0553 Fleet Sizing Across Different Humanitarian Organizations

Laura Turrini, Assistant Professor, European Business School, Germany
Nathan Kunz, Assistant Professor, University of North Florida, United States
Maria Besiou, Professor, Kuehne Logistics University, Germany
Luk Van Wassenhove, Professor, INSEAD, France

We focus on fleet management and empirically estimate what drives the fleet size of multiple humanitarian organizations in different countries. The analyzed elements include organization size, number of target beneficiaries, and country vulnerability. We derive additional insights by comparing our results across the case organizations.

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Saturday, 11:30 AM - 01:00 PM, Lincoln East Track: Empirical Research in Operations Management

Invited Session: Empirical Research in Healthcare Operations

Chair(s): Maria Ibanez

093-0248 The Impact of Medication Delays on Patient Health in the ICU

Lesley Meng, Student, The Wharton School, United States
Krzysztof Laudanski, Assistant Professor, University of Pennsylvania, United States
Ann Huffenberger, Director of Operations, University of Pennsylvania, United States
Christian Terwiesch, Professor, The Wharton School, United States

We study the hospital intensive care unit to investigate the impact of exogenous medication delays, introduced by shift changes, on granular patient health outcomes. We find that the magnitudes of these effects vary by medication type, which allows us to generate a priority list of medications to assist providers.

093-0450 Decomposing Volume's Impact on Performance: Lessons from Kidney Transplants

Philip Saynisch, Student, Harvard University, United States
Robert Huckman, Professor, Harvard University, United States
Nikos Trichakis, Associate Professor, MIT, United States

The relationship between greater volume and improved outcomes may result from better decision-making or better execution that comes with experience. We explore these relationships in kidney transplants and find that surprisingly, larger centers perform worse on two metrics of decision quality, but with somewhat better post-transplant outcomes.

093-0507 Physician Peer Effects on Speed and Quality: Evidence from the Emergency Department

Soroush Saghafian, Assistant Professor, Harvard University, United States
Raha Imanirad, Student, Harvard Business School, United States
Stephen Traub, Department of Emergency Medicine Chair, Mayo Clinic, United States

We estimate peer effects in the context of an Emergency Department (ED) setting by addressing the question of whether peer physicians' characteristics affect a focal physician's performance.Our findings provide strong evidence for the existence of peer effects in this setting and have important implications for improving the operations of EDs.

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Saturday, 11:30 AM - 01:00 PM, Lincoln West Track: Empirical Research in Operations Management

Invited Session: Emerging Topics in Empirical Service Operations

Chair(s): Yuqian Xu Baile Lu

093-0079 Supply Networks: Does Industry Matter?

Marcus Bellamy, Assistant Professor, Boston University, United States

We demonstrate differences in supply networks of focal firms according to industry. Through an empirical study, we highlight the extent to which the industry context plays in terms of the network structural characteristics and firm performance, where the characteristics of an average representative firm in each industry vary considerably.

093-0099 An Empirical Analysis of Market Formation, Pricing, and Revenue Sharing in Ride Hailing Services

Liu Ming, Assistant Professor, Chinese University of Hong Kong, China
Tunay Tunca, Professor, University of Maryland, United States
Yi Xu, Associate Professor, University of Maryland, United States
Weiming Zhu, Assistant Professor, I E S E, Spain

Using data obtained from a leading ride-sharing company, we construct and estimate a model of price and demand and supply formation in ride-sharing services based on operational characteristics, such as driver utilization and demand intensity. We further conduct a counterfactual analysis to examine efficiency and welfare implications of pricing and regulation.

093-1722 Decoding the Behaviors of Gig Economy Workers

Park Sinchaisri, Student, The Wharton School, United States
Gad Allon, Professor, The Wharton School, United States
Maxime Cohen, Assistant Professor, New York University, United States

Gig economy platforms benefit from labor flexibility, but also struggle in planning their workforce. We study on-demand workers' labor decisions in a ride-hailing context. Using the driver-level data on incentive and decisions and TLC trip record data, we develop an empirical framework to examine behaviors induced by gig platforms' mechanisms.

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Saturday, 11:30 AM - 01:00 PM, Jefferson East Track: Panels & Meetings

Contributed Session: Doctoral Consortium 1

Chair(s): Ozge Sahin

093-2430 Doctoral Consortium 1

Ozge Sahin, Associate Professor, Johns Hopkins University, United States

This session is by invitation only for those doctoral students who have registered. 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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Saturday, 11:30 AM - 01:00 PM, Georgetown East Track: Supply Chain Risk Management

Invited Session: Managing Supply and Market Risks

Chair(s): Rong Li

093-0065 Mitigating Disruption Risks in Delivery Supply Chains to Serve Contracted Customers

Mert Hakan Hekimoglu, Assistant Professor, Rensselaer Polytechnic Institute, United States
John Park, Assistant Professor, Pepperdine University, United States

Burak Kazaz, Professor, Syracuse University, United States

Motivated by an implementation in a Fortune 150 Company, we examine the role of risk aversion on capacity decisions in a delivery supply chain in the presence of supply disruptions. The proactive capacity decisions are coupled with reactive contingency routing decisions to mitigate the effects of disruptions.

093-0093 Long-Term Service Agreement in Power Systems with Renewable Penetration

Panos Kouvelis, Professor, Washington University St Louis, United States
Hirofumi Matsuo, Professor, Kobe University, Japan
Yixuan Xiao, Assistant Professor, City University of Hong Kong, Hong Kong
Quan Yuan, Associate Professor, Zhejiang University, China

Long-term service agreement (LTSA) is widely adopted in power systems for OEMs of generators and power plants to share equipment maintenance cost. We study LTSA between an OEM and a power plant with renewable penetrations and characterize the OEM's maintenance schedule, pricing and power plant's dynamic production decision.

093-0408 Value at Risk, Capacity, and Exchange Rate Hedging in Multiple Global Markets

Jian Chen, Professor, Tsinghua University, China
Qing Ding, Professor, Huazhong University of Science and Technology, China
Long Ren, Assistant Professor, University of International Business And Economics, China
Jeannette Song, Professor, Duke University Durham, United States

We consider the joint capacity and financial hedging strategies for a downside risk-averse global firm that faces multiple demand and foreign exchange rate risks. The firm maximizes the expected profit while controlling its profit risk through a Value-at-Risk (VaR) constraint.

093-1779 Inventory Cycle and Disruption Exposure

Xiaobo Ding, Student, Cornell University, United States
William Schmidt, Assistant Professor, Cornell University, United States

The firm faces a large variation in its disruption exposure over the normal inventory cycle in a concave way. Using real firm's data, we identify how a firm can make use of this concavity feature for risk planning and identify features of the parts that can best achieve this goal.

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Saturday, 11:30 AM - 01:00 PM, Georgetown West Track: Retail Operations

Invited Session: Retail Execution

Chair(s): Santiago Gallino

093-0449 Is Bracketing a Bane or a Boon for Online Retailers?

Aditya Balaram, Student, University of South Carolina, United States
Olga Perdikaki, Assistant Professor, University of South Carolina, United States
Michael Galbreth, Professor, University of Tennessee Knoxville, United States

Bracketing is the practice of ordering multiple sizes of a product and returning all that do not fit. Customers adopt this practice to resolve uncertainty surrounding physical fit. We build a stylized model to show that online retailers can leverage this seemingly negative customer practice to improve profit.

093-2054 Optimal Seller-Induced Learning: Joint or Decoupled Product Trials

Monire Jalili, Assistant Professor, Cleveland State University, United States
Eren Cil, Associate Professor, University of Oregon, United States
Michael Pangburn, Associate Professor, University of Oregon, United States

We study a firm selling multiple products to heterogeneous customers. To help customers resolve valuation uncertainty, the firm offers product trials, joint or decoupled, as are common in practice for vineyards. We investigate the trial structure and pricing to understand when joint trials are the optimal form of seller-induced learning.

093-0482 The Effect of Inventory Location On Demand in Online Retail

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

We consider a retailer with an online channel. Items sold through the channel are stored either at the retailer's central warehouse, with fast delivery, or at its suppliers, with slower delivery. We empirically investigate the impact of inventory location on demand and develop a procedure for how to allocate products.

093-1182 The Impact of Logistics on Retail Platform Competition: Evidence from Alibaba

Jiankun Sun, Student, Northwestern University, United States
Dennis Zhang, Assistant Professor, Washington University St Louis, United States
Jan Van Mieghem, Professor, Northwestern University, United States

Logistics is a key component of consumer online shopping experience and is important to the success of online retailing. Using quasi-natural experiments at Alibaba Group, we investigate how improving logistics service influences consumption behavior of consumers, and sales and competition of the online retailers and retailing platforms.

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Saturday, 11:30 AM - 01:00 PM, Cabinet Track: Sustainable Operations

Invited Session: Inclusive Innovation: A Panel Discussion

Chair(s): Beril Toktay Morvarid Rahmani

093-2442 Inclusive Innovation: A Panel Discussion

Karthik Balasubramanian, Assistant Professor, Howard University, United States
Saravanan Kesavan, Associate Professor, University Of North Carolina At Chapel Hill, United States
Bhavani Shanker Uppari, Assistant Professor, Singapore Management University, Singapore
Can Zhang, Assistant Professor, Duke University Durham, United States
Kamalini Ramdas, Professor, London Business School, United Kingdom

Inclusive innovation is the inclusion within some aspect of innovation of groups who are economically excluded. This session presents examples of inclusive innovation in the operations management context in three domains: (i) inclusive product and service innovation, (ii) inclusive process and business model innovation, and (iii) inclusive supply chain innovation.

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Saturday, 11:30 AM - 01:00 PM, Intl Ballroom East Track: Supply Chain Analytics

Invited Session: Inventory, Customer Management and Computation

Chair(s): Andre Cire

093-1157 Self-Guided Approximate Linear Programs

Parshan Pakiman, Student, University of Illinois at Chicago, United States
Selvaprabu Nadarajah, Assistant Professor, University of Illinois at Chicago, United States
Negar Soheili Azad, Assistant Professor, University of Illinois at Chicago, United States
Qihang Lin, Assistant Professor, University of Iowa, United States

Approximate linear programs (ALPs) provide policies and bounds for Markov decision processes (MDPs) arising in challenging operations management applications. Using ALP entails designing parametric MDP value function approximations, which poses a significant implementation hurdle. We develop an ALP scheme that side-steps this issue by leveraging sampling techniques from machine learning.

093-2378 Customer Acquisition and Retention: A Fluid Approach For Staffing

Eugene Furman, Student, York University, Canada
Adam Diamant, Assistant Professor, York University, Canada
Murat Kristal, Associate Professor, York University, Canada

We model the trade-off between customer acquisition and retention as a multi-class queueing network with returning customers, time-dependent arrivals, and abandonment. Based on its fluid approximation, we propose an approach to determine optimal stationary staffing levels that we test in two real-world applications: advertising campaigns and emergency room operations.

093-1888 Predictive and Prescriptive Analytics for Location Selection of Add-On Retail Products

Teng Huang, Student, University of Connecticut Storrs, United States
David Bergman, Assistant Professor, University of Connecticut, United States
Ram Gopal, Professor, University of Connecticut, United States

In this paper we study a predictive-and-prescriptive analytics framework for optimizing expansion decisions for retailers selling add-on products. We build predictive models for understanding the derived demand of the add-on product and establish an optimization framework for automating expansion decisions to maximize expected sales.

093-2271 Collobrations in Joint Replenishment

Simai He, Professor, Shandong University of Finance&Economics, China
Xuan Wang, Assistant Professor, Hong Kong University of Science and Technology, Hong Kong
Jawei Zhang, Associate Professor, New York University, United States

We enhance the study of collaborate in JRP by establishing a simple de-centralized mechanism of high efficiency, with an explanation of a numerical result of almost no lose in social efficiency. Furthermore, we discuss a general framework in which the convexity of a cooperative game is robust with respect to external effects.

Saturday, 02:15 PM - 03:45 PM

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Saturday, 02:15 PM - 03:45 PM, Piscataway Track: Energy Supply Chains

Invited Session: Energy management in supply chains and manufacturing

Chair(s): Tianhu Deng

093-0692 Capacity Investment in Renewable Energy Under Subsidy and Supply Uncertainty

Peng zhou, Professor, China University of Petroleum, China
Lumiao Li, Student, Nanjing University of Aeronautics and Astronautics, China

This paper studies a manufacturing firm's one-time capacity decision of renewable energy investment. A newsvendor model is constructed to determine optimal portfolio between renewable and non-renewable energy, taking into account subsidy fluctuation and supply intermittency. We conduct a trade-off analysis of capacity investment under uncertainty and present the managerial implication.

093-1646 How Does Energy Regulation Effect Environmental Performance ?

Jiang Jiang Yang, Student, University of Science and Technology of China, China

Energy regulation has been recognized as an important way to directly improve environmental performance or indirectly impact environmental performance through increasing environmental innovation. The present paper constructs an energy and carbon emission total factor productivity index using the Malmquist-Luenberger productivity index.

093-0461 An Effective Echo State Network Bagging Ensemble Model for Electricity Energy Consumption Forecasting

Huanling Hu, Student, Huazhong University of Science & Technology, China
Lin Wang, Professor, Huazhong University of Science & Technology, China

Electricity energy consumption (EEC) forecasting is important for governments to make energy policies. We propose an ensemble model (BESN) based on bagged echo state network for EEC forecasting which combines the advantages of ESN and bagging. Results of comparative examples show BESN outperforms traditional ESN and other existing popular models.

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Saturday, 02:15 PM - 03:45 PM, Oak Lawn Track: Marketing and Operations Management

Invited Session: Marketing and Operations Management Interface

Chair(s): Yunchuan Liu

093-0904 Return Channel Choice and Product Quality Decision with Uncertain Demand

Buqing Ma, Student, University of Science and Technology of China, China
Yunchuan Liu, Associate Professor, University of Illinois Urbana-Champaign, United States
Zhongsheng Hua, Professor, Zhejiang University, China

In this paper, we study a manufacturer's return channel choice and product quality decision with uncertain demand. Counterintuitively, we find that the manufacturer can undertake the return activity directly where even the salvage value is less. We also show that product quality may increase with demand uncertainty.

093-1006 Strategic Inventories and Vertical Contracts in Multi-Echelon Supply Chains

Qing Wu, Associate Professor, University of Electronic Science and Technology of China, China

Established findings suggest that strategic inventory may alleviate double marginalization and improve the efficiency of a decentralized two-echelon supply chain. However, the role of strategic inventory in multi-echelon supply chains remains largely unexplored. In this paper, we examine the effect of strategic inventory in multi-echelon supply chains.

093-1501 Consumer Inter-Product Showrooming and Information Service Provision in an Omni-Channel Supply Chain

Tao Zhang, Assistant Professor, University of Electronic Science & Technology of China, China
Gang Li, Professor, Xi'An Jiaotong University, China
T.C.E. Cheng, Professor, The Hong Kong Polytechnic University, China
Stephen Shum, Associate Professor, City University of Hong Kong, Hong Kong

Omni-channel retailing is quickly becoming a predominant norm of the industry and has an increasingly significant impact on the whole supply chain. Our research analytically examines the impacts of consumer showrooming and firms' information service provision on the supply chain performance and social welfare. Theoretical and managerial implications are provided.

093-0972 Is it Beneficial for the Retailer to Collaborate with a Consumer-to-Consumer Redistribution Platform?

Chen Pang, Student, Department of Logistic and Maritime Studies, China
Gang Li, Professor, Xi'An Jiaotong University, China
Li Jiang, Professor, Hong Kong Polytechnic Univ, Hong Kong

Retailers are aligning with a C2C redistribution platform to support consumers reselling used products. Our two-period model highlights a non-decreasing effect of the redistribution market size on new product demand. The retailer may generate higher revenue from charging different product prices in two periods depending on the market-clearing's secondary price.

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Saturday, 02:15 PM - 03:45 PM, Northwest Track: Operations and Sports Management

Contributed Session: Sports Operations and Leadership

Chair(s): Bosun Olaniyan

093-0378 Achieving Operational Sustainability in Elite Soccer: The Impact of the Sporting Director

Tony Asghar, Managing Director, Global Sports Management, United Kingdom
Sara Ward, Associate Professor, Manchester Metropolitan University, United Kingdom

Iain Reid, Reader, Manchester Metropolitan University, United Kingdom

The role of the Sporting Director is responsible for creating long-term sustainable leadership within a sporting organization and act as a conduit between the first team coach and the boardroom. The paper presents an organizational structure for advancing operational sustainability and how the role influences strategic capability, performance, and culture.

093-0269 Elite English Soccer - Boardroom Operational Effectiveness

Robert Price, Head of Medical, Leeds United Football Club, United Kingdom
Sara Ward, Associate Professor, Manchester Metropolitan University, United Kingdom
David Bamford, Professor, University of Huddersfield, United Kingdom

We critically evaluated the boardroom operational effectiveness of six elite lvel soccer clubs in England. The governing structures failed to meet recommended standards from both business and sport perspectives. Board composition in terms of diversity, age, and expertise were all areas of concern. Operational impacts on clubs' competitive advantage were evaluated.

093-0314 The Value of Emotional Intelligence in Sports Directorship

Lee Darnbrough, Head of Strategic Analysis and Recruitment, Hull City Football Club, United Kingdom
Sara Ward, Associate Professor, Manchester Metropolitan University, United Kingdom
Iain Reid, Reader, Manchester Metropolitan University, United Kingdom

This paper presents the value and impact of emotional intelligence between key stakeholders in terms of performance leadership and within an elite English football club (CEO / Manager). Specifically, how effective performance has been evaluated in strategic operations where there are not necessarily traditional measureable outcomes.

093-0388 Elite Sports - The Utilization of Data Analytics and Technology

Olatunbosun Olaniyan, Student, University of Huddersfield, United Kingdom
Benjamin Dehe, Reader, University of Huddersfield, United Kingdom
Sara Ward, Associate Professor, Manchester Metropolitan University, United Kingdom
David Bamford, Professor, University of Huddersfield, United Kingdom

This research investigates the utilization of data analytics and technology in elite sports. 20 interviews with industry experts were used to gain insight into this phenomenon. Findings indicate that the utilization has increased, however, there are indications of a clear digital divide. This is examined.

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Saturday, 02:15 PM - 03:45 PM, Morgan — Track: Public Sector Operations Management

Invited Session: Servitizing One-Stop Government Services

Chair(s): Gyula Vastag

093-1622 Developing and Improving Government Services: Contrasting Finland and Hungary

Gyula Vastag, Professor, Szechenyi Istvan University, Hungary
Markku Kuula, Professor, Aalto University, Finland
Antero Putkiranta, Senior Lecturer, Lappeenranta University of Technology, Finland

After WWII, delivery of government services took different development paths in Finland and Hungary: more reliance on decentralized and online services in the former and more emphasis on one-stop government service centers in the latter. The paper uses comparable sets of services to highlight development options for both.

093-1636 Servitization of Administrative Public Services in Hungary

Laszlo Buics, Student, Szechenyi Istvan University, Hungary

The aim of this research is to examine how the concept of servitization can be applied within the framework of the Unified Services Theory on the Hungarian Government Windows. The results can help to identify improvement possibilities and reduce waiting times thus creating a more efficient and customer friendly service system.

093-1619 Mapping and Contrasting Improvement Options for One-Stop Government Service Centers in Hungary

Gyula Vastag, Professor, Szechenyi Istvan University, Hungary
Agnes Jenei, Associate Professor, National University of Public Service, Hungary

Using concept-mapping, improvement options for selected – with contrasting population characteristics from the 300 or so units in Hungary – one-stop government service centers (offering up to 2,000 service types) were developed and contrasted. The output of this analysis was used to create an action plan for improvement.

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Saturday, 02:15 PM - 03:45 PM, Kalorama — Track: Emerging Topics in Operations Management

Invited Session: On-Demand Platforms

Chair(s): Guangwen Kong

093-0628 Surge Pricing and Two-Sided Temporal Responses in Ride-Hailing

Bin Hu, Associate Professor, Naveen Jindal School of Management, United States
Ming Hu, Professor, University of Toronto, Canada
Han Zhu, Student, Mcgill University, Canada

We study surge pricing from a temporal perspective capturing riders' and drivers' different response time to pricing changes. We identify an equilibrium of a price surge followed by a lower price and another equilibrium of a low price followed by a higher price which is superior to the former.

093-0771 On-Demand vs Pooled Transportation: Consumer Preferences and System Design

kashish arora, Student, Cornell University, United States

Fanyin Zheng, Assistant Professor, Columbia University, United States
Karan Girotra, Professor, Cornell University, United States

We look at drivers of choice between on-demand cabs and a pre-determined and scheduled shuttle service. First, we estimate the “inconvenience costs” associated with shuttle platforms. Second, we use these estimates to design policy counterfactuals for determining the pricing scheme and optimal size of the shuttle service.

093-1716 Harnessing the Double-Edged Sword via Routing: Information Provision on Ride-Hailing Platforms

Leon Chu, Assistant Professor, USC, United States
Zhixi Wan, Associate Professor, University of Oregon, United States
Dongyuan Zhan, Assistant Professor, University College London, United Kingdom

We consider a ride-hailing platform that provides free origin and destination information to taxi drivers. Information provision is a double-edged sword: the drivers may choose to take more profitable riders via “strategic idling”. We propose a routing policy that aligns the incentives and achieves the first-best outcome for large systems.

093-2190 On-Demand Freight Matching

Guangwen Kong, Assistant Professor, University of Minnesota - Twin City, United States
Ankur Mani, Assistant Professor, University of Minnesota, United States
Zicheng Wang, Student, University of Minnesota - Twin City, United States

We study the matching frequency of an on-demand freight matching platform to match truck drivers and shippers.

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Saturday, 02:15 PM - 03:45 PM, Jay Track: Emerging Topics in Operations Management

Invited Session: Blockchain-Driven Operations Management

Chair(s): Fuqiang Zhang Fasheng Xu

093-1287 Inventory, Speculators, and Initial Coin Offerings

Jingxing (Rowena) Gan, Student, University of Pennsylvania, United States
Serguei Netessine, Professor, OID, United States
Gerry Tsoukalas, Assistant Professor, University of Pennsylvania, United States

Initial Coin Offerings (ICOs) are an emerging form of fundraising for Blockchain-based startups. We examine how ICO campaigns should be optimally designed in the presence of demand uncertainty and discuss the implications this new form of financing has for firm's operational decisions and profits.

093-2029 Blockchain and the Value of Operational Transparency for Supply Chain Finance

Jiri Chod, Associate Professor, Boston College, United States
Nikos Trichakis, Associate Professor, MIT, United States
Gerry Tsoukalas, Assistant Professor, University of Pennsylvania, United States
Henry Aspegren, Student, Massachusetts Institute of Technology, United States
Mark Weber, Scientist, IBM, United States

We develop a theory that shows signaling a firm's fundamental quality to lenders through inventory transactions to be more efficient than signaling through loan requests. We argue that blockchain technology has the potential to enable inventory transaction verifiability more efficiently than traditional monitoring mechanisms.

093-0917 The Ethics and Sustainability of Blockchain

Mehrnaz Khalajhedayati, Student, University of Rhode Island, United States
Dara Schniederjans, Associate Professor, University of Rhode Island, United States

Blockchain technology has a strong potential to improve supply chain management by reducing time delays, human errors, and costs. In this presentation, results from a systematic literature review will be presented in order to derive both gaps and potential applications of blockchain technology specifically to supply chain sustainability and ethics.

093-2179 Will Blockchain Disrupt or Bankrupt Supply Chains?

Sarah Sengupta, Assistant Professor, St.Cloud State University, United States
Sandeep Jagani, Assistant Professor, Illinois State University, United States
Marouen Ben Jebara, Assistant Professor, University of South Carolina, United States

The latest craze of digital ledger technology (aka Blockchain) is creating waves across multiple industries, but particularly through supply chains and distributive manufacturing. The study explores the Blockchain’s taxonomy and its economic and environmental sustainability impact on supply chains. Ideas for future research are presented.

093-2130 Information Transparency in Rationing Games

Yao Cui, Assistant Professor, Cornell University, United States
Vishal Gaur, Professor, Cornell University, United States
Jingchen Liu, Student, Peking University, China

Motivated by the new technologies such as Blockchain that enables information transparency in supply chains, we study the impact of information transparency on supply chain rationing games.

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Saturday, 02:15 PM - 03:45 PM, Holmead East Track: Behavioral Operations Management

Contributed Session: Behavioral Issues in Various Contexts

Chair(s): James Cotton

093-0845 The Effect of Organizational Structure in Learning from Near Misses

Juan Madiedo, Assistant Professor, Rotterdam School of Management, Netherlands
Helge Klapper, Assistant Professor, Rotterdam School of Management, Netherlands

Firms often fail to identify and learn from near-misses. Whereas previous research has focused on individuals as a source of such missed opportunities, we argue that the interplay between organization structure and environment significantly affects the likelihood of avoidance of failure. We use a computer simulation to explore these effects.

093-1711 Knowledge Sharing in Crowdsourcing Competitions: Role of Personality Traits

Indika Dissanayake, Assistant Professor, University of North Carolina Greensboro, United States
Sridhar Nerur, Professor, University of Texas Arlington, United States

In this study, we draw on the Big-Five Factor Model of personality to investigate the relationship between solvers' knowledge sharing behavior in a competitive crowdsourcing environment and their personalities (e.g., openness, conscientiousness, agreeableness, extraversion, emotional stability), as measured by the social tones manifested in their online posts.

093-1255 The Impact of Customer and Employee Engagement on Operations Performance

Abdel Latef Anouze, Assistant Professor, QU, Qatar

Several studies investigated the impact of employee or customer engagement on performance, however, few have studied the impact of both simultaneously on performance. This study investigates the integrated impact of both customer and employee engagement on bank performance. Performance is measured by DEA.

093-2363 Antecedents of Fuel-Efficient Vehicle Operation

James Cotton, Student, Air Force Institute of Technology, United States

Using the Theory of Planned Behavior (TPB), we investigate the antecedent-dependent relationships between intrinsic factors (e.g. intentions, beliefs, subjective norms) and reported factors (e.g. driving style, fuel efficiency, vehicle maintenance). We compare and contrast literature studying professional and civilian vehicle operators.

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Saturday, 02:15 PM - 03:45 PM, Holmead West Track: Finance and Operations Management

Invited Session: Empirical Research on OM-Finance Interface II

Chair(s): Jing Wu

093-0520 Collateral-Based Financing and Inventory Theory

Vernon Hsu, Professor, Chinese Univ of Hong Kong, Hong Kong
Jing Wu, Assistant Professor, City University of Hong Kong, Hong Kong

Inventory can be pledged as collateral to obtain financial gains. In this research, we develop a parsimonious theoretical model on the inventory stock level and find that the optimal inventory is positively associated with expected risk-adjusted investment returns. We empirically confirm this using data from China commodity.

093-0667 Operational Risk Management: An Optimal Inspection Policy

Youngsoo Kim, Assistant Professor, University of Alabama Tuscaloosa, United States
Yuqian Xu, Assistant Professor, University of Illinois Urbana-Champaign, United States

In this paper, we consider the design of an optimal inspection policy for a financial services firm that aims to mitigate operational risk losses. We consider a principal-agent setting where the principal hires an inspection team to check the operational risk events periodically.

093-0711 Dynamic Invoice Discounting

Nitish Jain, Assistant Professor, London Business School, United Kingdom
Nishant Mishra, Assistant Professor, K.U.Leuven, Belgium
S. Alex Yang, Associate Professor, London Business School, United Kingdom
Yuxuan Zhang, Student, Tsinghua University, China

Using a proprietary dataset, we analyze the suppliers' and buyers' behavior on offering and accepting invoice discounting. This allows us to explore the economic reasons behind trade credit and invoice discounting, as well as the potential strategies for the platform to optimize its profit/growth.

093-1048 Do Analytical Models Explain Actual Payment Term Extensions for Supply Chain Finance?

David Wuttke, Assistant Professor, Ebs Business School, Germany

In part, analytical models explain actual payment term extensions for supplu chain finance. Leveraging a large dataset, we study how supply chain finance/reverse factoring is actually used to extend payment terms. Contrasting actual decisions with predictions based on profit-maximizing assumptions, we discuss possible implications for normative models.

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Saturday, 02:15 PM - 03:45 PM, Gunston East Track: Humanitarian Operations and Crisis Management

Invited Session: Social Media in Crisis Management

Chair(s): Amanda Hughes

093-0945 Integrating Technology Within Community Emergency Response Team Operations

Steve Peterson, Virtual Operations Team Lead, Montgomery County CERT, United States

Montgomery County, Maryland Community Emergency Response Team (CERT) will share experiences from its virtual activations where technology was the key component to success. Virtual activations ranged from local level situational reporting to international level social media monitoring and data analysis.

093-2045 Human-AI Collaboration Approach to Enhance Social Media Response of Emergency Services

Hemant Purohit, Assistant Professor, George Mason University, United States

Ubiquitous adoption of social media has set high expectations for emergency responders to serve the public online. However, the information overload of social media requests to help challenges the emergency services. This work introduces a human-AI collaboration methodology to assist emergency services in effectively responding to online serviceable requests.

093-1684 Socio-Technical System Hybrids: Social Media Data for Crisis Response

Andrea Tapia, Associate Professor, Penn State University, United States
Jess Kropczynski, Assistant Professor, Uiniversity of Cincinnati, United States
W.R. Grace, Post Doc/Researcher, Pennsylvania State University, United States
S Halse, Student, Pennsylvania State University Harrisburg, United States

The goal of this paper is to understand and design the socio-technical interface between emergency organizations and social media that delivers real time answers, driven by organizational questions and requirements and meet organizational issues of fit. Trained systems, volunteers, and analysts can both contribute directly to a shared information system and help process data.

093-1847 Incorporating Social Media into Emergency Exercises

Amanda Hughes, Assistant Professor, Brigham Young University, United States

Social media has proven useful for emergency managers, however, training emergency managers how to efficiently and effectively use social media in their practice remains challenging. To address these challenges, we discuss our research in the development of open source tools and exercises for incorporating social media training into emergency management.

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Saturday, 02:15 PM - 03:45 PM, Gunston West Track: Next Generation Operations

Invited Session: Data Driven Operations

Chair(s): Sajad Modaresi

093-0188 Near Optimal Policies for Dynamic Assortment Planning Under MNL Models

Xi Chen, Assistant Professor, New York University, United States
Yining Wang, Student, Carnegie Mellon University, United States
Yuan Zhou, Assistant Professor, Indiana University at Bloomington, United States

In this talk, we consider the dynamic assortment selection problem under an uncapacitated multinomial-logit (MNL) model. By carefully analyzing the revenue potential function, we proposed an efficient trisection algorithm that achieves an item-independent regret bound of O(\sqrt{T\log\log T}), which matches information from theoretical lower bounds up to iterated logarithmic terms.

093-0226 Pricing Hype: Capturing Demand Hype or Stagnation in Dynamic Pricing

Mengzhenyu Zhang, Student, University of Michigan, United States
Hyun-Soo Ahn, Professor, University of Michigan, United States
Christopher Ryan, Associate Professor, University of Chicago Booth School of Business, United States
Joline Uichanco, Assistant Professor, University of Michigan, United States

With growing access to information (through social media, review aggregation websites), customers are increasingly influenced by word-of-mouth and by awareness of a product's scarcity when deciding to buy. We study a joint pricing and initial inventory problem where the demand distribution can be dynamically affected by past sales and/or inventory.

093-1042 The Impact of IPO on Peer-to-Peer Lending Platforms

Maxime Cohen, Assistant Professor, New York University, United States
Kevin Jiao, Student, New York University, United States

Using large loans data, we infer the impact of initial public offering (IPO) on peer-to-peer lending platforms. We use several econometric tools and find that several metrics were affected by the IPO filing: the loans' performance decreased, borrowers' requirements diminished, and the acceptance rate inflated.

093-1379 Interpretable Optimal Stopping

Velibor Misic, Assistant Professor, University of California Los Angeles, United States
Florin Ciocan, Assistant Professor, INSEAD, France

In this talk, we develop a new way of solving optimal stopping problems by directly finding policies in the form of binary trees from a sample of trajectories. We apply our approach to option pricing and show that it outperforms state-of-the-art methods while offering more interpretable and transparent policies.

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Saturday, 02:15 PM - 03:45 PM, Fairchild East Track: POM in Practice

Invited Session: Empirical Operations in Practice

Chair(s): Dennis Zhang Jiankun Sun

093-0190 The Value of Speed: A Randomized Field Experiment in E-commerce

Santiago Gallino, Assistant Professor, The Wharton School, United States
Nil Karacaoglu, Student, Kellogg School of Management, United States
Antonio Moreno, Associate Professor, Harvard University, United States

We leverage a randomized field experiment to investigate the impact of website performance on online sales.

093-2046 Moderation in the Pursuit of Truth: Should Social Media Platforms Limit Shares

Jiding Zhang, Student, The Wharton School, United States
Ken Moon, Assistant Professor, The Wharton School, United States
Senthil Veeraraghavan, Professor, University of Pennsylvania, United States

We investigate whether the credibility of a news item's informational content influences the individual decisions of social media users on whether to share it, and if so, how strongly. We propose that some controls on the velocity of information benefit both social welfare and the platform.

093-0100 Promotional Strategies of OTC Drugs

Xinyu Liang, Student, University of Michigan Ann Arbor, United States
Yixin Iris Wang, Assistant Professor, University of Illinois Urbana-Champaign, United States
Jun Li, Assistant Professor, University of Michigan Ann Arbor, United States

Facing competition from online channels, it becomes a challenge task for brick and mortar pharmacies to secure loyal customers while maintaining the already low margin on over-the-counter medicinal products. We exploit a change on store promotion designs and identify the determinants of successful promotions that balance sales and margins.

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Saturday, 02:15 PM - 03:45 PM, Fairchild West Track: Economics Models in Operations Management

Invited Session: OM and Marketing Interface

Chair(s): Xiajun Pan Gang Li

093-0330 Consumer Fairness Concerns and Dynamic Pricing in a Decentralized Channel

Wen Diao, Student, Fudan University, United States
Mushegh Harutyunyan, Assistant Professor, Nazarbayev University Graduate School of Business, Kazakhstan
Baojun Jiang, Associate Professor, Washington University St Louis, United States

This paper examines dynamic pricing decisions in a decentralized channel in a growing market where consumers may have fairness concerns when the retailer increases its price over time. We show that consumer fairness concerns have non-monotonic effects on firms' optimal prices and can benefit both the manufacturer and the retailer.

093-0718 Membership-Based Premium Shipping: How Does It Affect E-Retailers' Competition?

Ming Jin, Student, Xi'An Jiaotong University, China
Gang Li, Professor, Xi'An Jiaotong University, China
Xiajun Pan, Assistant Professor, University of Florida, United States

Many retailers adopt membership-based premium shipping (PS) service to attract more consumers owing to the fast delivery. We develop a theoretical model where two competing e-retailers have the option of providing PS. Interestingly, we find that the PS may soften the competition and enable the retailers to charge higher prices.

093-1149 Information Provision vs Information Manufacturing: The Role of Media Platform

Yonghon An, Associate Professor, Texas A&M University College Station, United States
Weining Bao, Assistant Professor, University of Technology Sydney, China
Jian Ni, Associate Professor, Johns Hopkins University, United States

Content producers often try to push certain information while being concerned about their careers and reputations. Even though the platforms provide content providers an opportunity to influence consumers, potential bias could distort these efforts. We investigate how media platforms' bias interacts with informational manipulation and the implications of such interactions.

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Saturday, 02:15 PM - 03:45 PM, Embassy Track: Environmental Operations Management

Invited Session: Topics in Sustainable OM: Electric Vehicles and Water Quality

Chair(s): Sang Won Kim

093-0531 Charging Electric Vehicle Sharing Fleet

Long He, Assistant Professor, National University of Singapore, Singapore
Guangrui Ma, Assistant Professor, Tianjin University, China
Wei Qi, Assistant Professor, Mcgill University, Canada
Xin Wang, Assistant Professor, University of Wisconsin Madison, United States

We develop models to jointly optimize the sites and sizes of charging stations, along with the coupled fleet charging and repositioning operations. Our nonlinear optimization model closely tracks EV energy levels and explicitly depicts stochastic charging operations. We conduct a case study with data sets of Car2Go's operations.

093-0577 Optimizing Water Pollution Monitoring Systems: Regulation Policy Guideline for Curbing Nutrient Pollution

Michael Lim, Associate Professor, Seoul National University, South Korea
Jeffrey Linderoth, Professor, University of Wisconsin-Madison, United States
Xin Wang, Assistant Professor, University of Wisconsin Madison, United States

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

093-0907 Optimizing the Relocation Operations of Free Floating Electric Car Sharing Systems

Zulqarnain Haider, Student, University of South Florida, United States
Hadi Charkhgard, Assistant Professor, University of South Florida, United States

Sang Won Kim, Assistant Professor, CUHK Business School, Hong Kong
Changhyun Kwon, Associate Professor, University of South Florida, United States

In a free-floating-electric-carsharing system, the problems of fleet placement to fulfill demand requirements, fleet recharging using limited infrastructure to fulfill recharging requirements, and driver pick-up and delivery using shuttles are of interest. We present a combined MILP-formulation and a decomposition algorithm to solve the aforementioned problems simultaneously, rather than sequentially.

093-1306 Empirical Investigation on the Range Anxiety for Electric Vehicles

Sang Won Kim, Assistant Professor, CUHK Business School, Hong Kong
Ho-Yin Mak, Associate Professor, Oxford University, United Kingdom
Marcelo Olivares, Assistant Professor, Universidad De Chile, Chile
Ying Rong, Professor, Shanghai Jiao Tong University, China

One of the most well-cited reasons for slow adoption of electric vehicles is the range anxiety. However, it has not been adequately quantified, quite possibly due to the lack of quality data. We propose a novel way to do so by use of a dataset from a car sharing platform.

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Saturday, 02:15 PM - 03:45 PM, Du Pont Track: Revenue Management and Pricing

Contributed Session: Pricing in Revenue Management (2)

Chair(s): Michael von Massow

093-2170 Competitive Dynamic Pricing with Customer Reference Prices

Katherine Ashley, Assistant Professor, Montclair State University, United States
Soheil Sibdari, Associate Professor, University of Massachusetts Dartmouth, United States

In markets where prices fluctuate frequently, customers often form reference prices that influence their purchase decisions in future periods. We develop a finite-horizon model of dynamic price competition between two firms when the prices of both firms affect a shared market reference price.

093-0424 Modeling Customized Pricing Based on Multiple Attributes

Godwin T, Professor, IIM Tiruchirappalli, India

Customized pricing entails quoting different prices by a seller to each customer request for a product. The choice of buying the product by a customer is a function of the quoted price, product attributes, and customer attributes. A logit model is developed to predict the outcome of customized pricing.

093-2019 Time-Consistent, Risk-Averse Dynamic Pricing

Rouven Schur, Student, Universitat Augsburg, Germany
Jochen Gönsch, Professor, Universitaet Duisburg Essen, Germany
Michael Hassler, Post Doc/Researcher, Universitat Augsburg, Germany

We use a dynamic, coherent risk-measure to ensure that decisions are actually implemented and only depend on states that may realize. A transformation to a risk-neutral problem allows to easily incorporate risk-aversion into existing dynamic pricing systems. This also justifies using “conservative” estimates of selling probabilities.

093-1308 An Optimal Hotel Pricing Model with Two Channels, Multiple Periods and Switching

Michael von Massow, Associate Professor, University of Guelph, Canada
Mustafa Canbolat, Associate Professor, Suny Brockport, United States

The hotel pricing decision in multiple channels is important as shifting a buyer from one channel to another may result in lower returns. We present a two period, two channel pricing model with switching, and show that optimal price in the lower value channel gets higher over time.

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Saturday, 02:15 PM - 03:45 PM, Cardozo Track: Data Science

Invited Session: POMS - JD.com Data Driven Research Paper Competition I

Chair(s): Zeyu Zheng

093-2473 Hedging the Drift: Learning to Optimize under Non-Stationarity

Wang Chi Cheung, Assistant Professor, National University of Singapore, Singapore
David Simchi-Levi, Professor, Massachusetts Institute of Technology, United States
Ruihao Zhu, Student, MIT, United States

We introduce general algorithms with state-of-the-art dynamic regret bounds for non-stationary bandit settings. They capture applications in advertisement allocation and dynamic pricing in changing environments. We also conduct numerical experiments on the CPRM-12-001: On-Line Auto Lending dataset to demonstrate the superior performances.

093-2472 Multi-Product Price Optimization Under a General Cascade Click Model with Filters

Xiangyu Gao, Assistant Professor, The Chinese University of Hong Kong, Hong Kong
Stefanus Jasin, Associate Professor, University of Michigan, United States
Sajjad Najafi, Post Doc/Researcher, University of Michigan - Ann Arbor, United States
Huanan Zhang, Assistant Professor, Penn State University University Park, United States

We consider a pricing problem for a set of products displayed on a list. We first analyze the optimization problem and then study the case where the parameters are unknown and need to be estimated through price experiments. For this case, we develop online algorithms with tight regret rates.

093-2477 Detecting Customer Trends for Optimal Promotion Targeting

Lennart Baardman, Student, Massachusetts Institute of Technology, United States
Setareh Boroujeni, Principal Scientist, Oracle, United States
Tamar Cohen-Hillel, Student, Massachusetts Institute of Technology, United States

Kiran Panchamgam, Senior Scientist, Oracle, United States
Georgia Perakis, Professor, Massachusetts Institute of Technology, United States

Detecting trends can help retailers determine effective personalized promotion plans. We introduce a personalized demand model that captures customer-trends from transaction data. Moreover, we develop a provably-good greedy approach for the promotion targeting problem. Using data from a large fashion retailer, we test our customer-trend model and the targeting algorithm.

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Saturday, 02:15 PM - 03:45 PM, Coats Track: Manufacturing Operations

Invited Session: Data-Driven Optimization for Manufacturing Operations

Chair(s): Melvin Drent

093-0698 Condition-Based Repair Prioritization in Repairable Inventory Supply Chains

Chiel van Oosterom, Assistant Professor, Erasmus University Rotterdam, Netherlands
Joachim Arts, Associate Professor, University of Luxembourg, Luxembourg
Geert-Jan Van Houtum, Professor, Eindhoven University of Technology, Netherlands

We propose a model for exploiting information collected via condition monitoring of components in the field to dynamically prioritize repairs in a capacitated repair shop. In this paper, our objective is to maximize the long-run availability of a series system that comprises different repairable components.

093-0828 Mining Optimal Policies: A Pattern Recognition Approach to Model Analysis

Fernanda Bravo, Assistant Professor, UCLA Anderson School of Management, United States
Yaron Shaposhnik, Assistant Professor, Simon Business School, United States

This paper studies the application of machine learning algorithms for discovering structural properties of optimal policies in numerically obtained solutions to optimization problems. We study a framework that provides a systematic approach to model analysis which complements theoretical and numerical methods.

093-0843 Realtime Integrated Learning and Decision Making for Deteriorating Systems

Collin Drent, Student, Eindhoven University of Technology, Netherlands
Melvin Drent, Student, University of Luxembourg, Luxembourg
Joachim Arts, Associate Professor, University of Luxembourg, Luxembourg
Stella Kapodistria, Assistant Professor, Eindhoven University of Technology, Netherlands

We consider the condition-based maintenance of a component for which there is uncertainty about the parameters of the degradation process. These parameters are inferred with increasing accuracy using real-time signal observations in a Bayesian framework. By formulating this problem as a Markov decision process, we characterize the optimal policy.

093-0987 Machine Tools with Hidden Defects: Optimal Usage for Maximum Lifetime Value

Alp Akcay, Assistant Professor, Eindhoven University of Technology, Netherlands
Engin Topan, Assistant Professor, University of Twente, Netherlands
Geert-Jan Van Houtum, Professor, Eindhoven University of Technology, Netherlands

We consider randomly failing machine tools that go through a hidden defective phase. The products processed by a defective tool generate less value. We characterize the optimal inspection and retirement policy of a tool that maximizes the tool's lifetime value under mild conditions on economic and tool-related parameters.

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Saturday, 02:15 PM - 03:45 PM, Columbia 1 Track: Scheduling and Logistics

Invited Session: Innovations in Crowdsourced Urban Delivery

Chair(s): Yanshuo Sun

093-0467 On-Demand Crowdsourced Urban Delivery with Rebalancing Consideration in a Dynamic Environment

Bo Zou, Associate Professor, University of Illinois at Chicago, United States
Tanvir Ahamed, Student, University of Illinois at Chicago, United States

In this research, we focus on a specific type of crowdshipping which deals with delivering shipments between distributed locations such as from restaurants, retail, grocery, and drug stores to customers within guaranteed time. Fast, high-quality algorithms are developed with consideration of strategic repositioning of crowdsourcees to enhance shipping efficiency.

093-0560 Dynamic Pricing of Flexible Time Slots for Attended Home Delivery Management

Nalan Gulpinar, Associate Professor, Warwick Business School, United Kingdom
Arne Strauss, Associate Professor, The University of Warwick, United Kingdom
Yijun Zheng, Student, Warwick Business School, United Kingdom

We propose to introduce flexible delivery time slots as opposed to the standard fixed slots. Scalable optimisation methodlogy is developed. We empirically investigate the potential of introducing such slots to reduce costs and/or to improve revenue in a realistically-sized case study.

093-0793 Crowdshipping and Same-Day Delivery: Employing In-Store Customers to Deliver Online Orders

Iman Dayarian, Assistant Professor, University of Alabama Tuscaloosa, United States

We introduce a setting in which in-store customers supplement company drivers and deliver online orders. Online order placements and in-store customer arrivals are highly stochastic. We develop two approaches: first, we focus on the system state when making decisions, then we incorporate probabilistic information about future orders and customer arrivals.

093-2231 Crowdsourced On-Demand Delivery with Incentive Mechanisms

Yanshuo Sun, Assistant Professor, Florida State University, United States
Zhi-Long Chen, Professor, University of Maryland, United States

In a crowdsourced delivery system, providing incentives to non-professional delivery drivers so that drivers are willing to revise their predetermined trip schedules could potentially overcome the shortage of supply. This study proposes an integrated optimization method for determining parcel-driver matches, delivery routes, and incentives to drivers.

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Saturday, 02:15 PM - 03:45 PM, Columbia 2 Track: Operational Excellence

Contributed Session: Performance management issues

Chair(s): Torbjørn Netland

093-0313 Factors to Be Considered While Pursuing Lead Time Advantage

Naveen Narayanan, Student, University of Buckingham, Oman

On-time performance is affected by factors such as process variation, arrival variation, production rate, and process time, all of which have detractors. These may include failure demand, rework, overproduction, availability, speed, and demand variation to name a few. This research explores choice of techniques for lead-time compression.

093-0566 On The Relation Between Quality Indicators and the Level of Process Deviations at the Workstation

Ebly Sanchez, Director VPS Americas, Volvo Group, United States
Knut Akesson, Professor, Chalmers University of Technology, Sweden

We identify process characteristics that can reduce manufacturing flow deviations. Our hypothesis is that reducing deviations at the workstation will improve the quality indicators. The hypothesis is evaluated by collecting quantitative data from three different plants within the Volvo Group. Preliminary results indicate the validity of the hypothesis.

093-1750 Concept Fallibility in OM Research: The Case of Lean Service

Pär Ahlström, Professor, Stockholm School of Economics, Sweden
Niklas Modig, Lecturer, Stockholm School of Economics, Sweden

Through systematically reviewing lean service papers, we determine the adverse effects of basing OM research on practical concepts. Being a practical discipline, OM research runs the risk of relying on practical concepts, particularly around operational excellence. This poses clear risks given our scholarly interest in developing cumulative knowledge.

093-2359 Metrics for Reducing Order Fulfillment Lead Times in Engineer-to-Order Firms

Erlend Alfnes, Associate Professor, NTNU, Norway
Marco Semini, Associate Professor, NTNU, Norway
Torbjørn Netland, Assistant Professor, Eth Zurich, Switzerland

In engineer-to-order (ETO) industries, rapid order fulfillment can yield a significant competitive advantage. Through in-depth case studies of three buyer-supplier dyads in the maritime industry, we study how to reduce order lead times in ETO supply chains.

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Saturday, 02:15 PM - 03:45 PM, Columbia 3 Track: Operational Excellence

Invited Session: Lean Six Sigma for Operational Excellence 1

Chair(s): Jiju Antony

093-1080 Lean Six Sigma in Banking – Drivers, Inputs, Influencers and Outcomes

Vijaya Sunder M, Student, Indian Institute of Technology Madras, India
L.S. Ganesh, Professor, Indian Institute of Technology Madras, India
Rahul Marathe, Associate Professor, Indian Institute of Technology Madras, India

Lean Six Sigma (LSS) has proved its value in services. However, only limited academic research is available on the empirical application of LSS in banking. To bridge this gap, this paper presents a comparative-case-approach highlighting the drivers, inputs, influencers, and outcomes of LSS in banking.

093-0013 Learning Organization as a Mediator of Total Quality Management and Performance

Guilherme Tortorella, Assistant Professor, Universidade Federal De Santa Catarina, Brazil
Ricardo Giglio, Assistant Professor, Universidade Federal De Santa Catarina, Brazil
Flavio Fogliatto, Professor, Universidade Federal Do Rio Grande Do Sul, Brazil
Rapinder Sawhney, Professor, University of Tennessee Knoxville, United States

This study aims to examine the mediating effect of Learning Organization (LO) based on the relationship between Total Quality Management (TQM) and operational performance improvement. A survey was carried out and data was analyzed through multivariate techniques. Results show that an enhanced LO capability impacts performance improvement level through TQM application.

093-0010 Pervasiveness of Lean Production Principles Through Practitioners' Experience and Generational Differences

Guilherme Tortorella, Assistant Professor, Universidade Federal De Santa Catarina, Brazil
Rogério Miorando, Associate Professor, Universidade Federal De Santa Catarina, Brazil
Marcelo Meiriño, Associate Professor, Universidade Federal Fluminense, Brazil
Rapinder Sawhney, Professor, University of Tennessee Knoxville, United States

This study aims to investigate the effect of practitioners' experience and generational differences in the adoption of Lean Production (LP) principles. A survey was carried out and data was analyzed based on multivariate techniques. Results show that different combinations between practitioners experience and generations entail higher likelihood of principles' adoption.

093-1788 Development of a 5S Maturity Model Through Entropy Measure

Rajan Ranjith Kumar, Student, Indian Institute of Technology Madras, India
L.S. Ganesh, Professor, Indian Institute of Technology Madras, India
Rajendran Chandrasekharan, Professor, Indian Institute of Technology Madras, India

Research literature points to 5S, a simple yet powerful method, as the foundation of other quality practices such as Lean and TPM. This paper presents a novel 5S maturity model with thresholds defined using an entropy measure. An example of its application is provided.

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Saturday, 02:15 PM - 03:45 PM, Columbia 4 Track: Healthcare Analytics

Invited Session: Data-Driven Decision-Making

Chair(s): David Rea Craig Froehle

093-0888 Approximate Dynamic Programming for Online Scheduling

Zlatana Nenova, Assistant Professor, University of Denver, United States
Dan Zhang, Associate Professor, University of Colorado Boulder, United States
Manuel Laguna, Professor, University of Colorado Boulder, United States

Dynamic appointment scheduling received considerable attention in recent years. We propose an approximate dynamic programming approach for the problem. Our approach is simulate-based and can accommodate rather complex system dynamics. We validate the approach using problem instances based on data from a public hospital in the US.

093-0892 Optimizing Healthcare Interventions

Margret Bjarnadottir, Assistant Professor, University of Maryland, United States
Weiguang Wang, Student, University of Maryland, United States
Leila Zia, Student, Wikipeida, United States

Risk prediction models are increasingly common in the health care system. The application of these models in clinical settings includes a choice of which intervention programs, if any, to offer and to whom in order to improve outcomes. We model two applications and report the results.

093-1700 Pain Management via Opioids: Incorporating Opioid Induced Hyperalgesia

Abdullah Gokcinar, Student, University of Texas Dallas, United States
Metin Cakanyildirim, Professor, University of Texas Dallas, United States

Use of opioids in pain management constitutes a significant challenge in healthcare. Underprescription of opioids yields inadequate pain-relief, while overprescription leads to ongoing opioid epidemic. Both are burdensome for the society. We study the optimum opioid-use decisions in an analytical (probabilistic) model under various prescription/treatment policies.

093-1371 Probabilistic Forecasting for Online Staffing Decisions in the Emergency Department

David Rea, Student, University of Cincinnati, United States
Craig Froehle, Professor, University of Cincinnati, United States

Evidence is mounting that point-estimate forecasts are inadequate inputs for operational planning decisions in highly uncertain environments. Probabilistic forecasting techniques, which quantify uncertainty, are rarely used for planning. This research compares the effectiveness of probabilistic forecasting versus point-estimate techniques for use in emergency department staffing decisions.

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Saturday, 02:15 PM - 03:45 PM, Columbia 5 Track: Healthcare Operations Management

Invited Session: Healthcare incentives and their impact

Chair(s): Kraig Delana

093-1126 Resolving the RACket: Improving Recovery Audit Contractor Policies for Medicare Reimbursement

James Abbey, Assistant Professor, Texas A&M University College Station, United States
Neil Geismar, Professor, Texas A&M University College Station, United States
Rogelio Oliva, Professor, Texas A&M University College Station, United States

Medicare audits are deeply flawed. Medicare's auditors recoup billions of dollars every year from hospitals without proper justification. The auditing flaws greatly hinder hospital management. Over 70% of such auditing reclamations are overturned within five years of appeals. This paper addresses these systemic flaws in the U.S. healthcare system.

093-0197 Hospital Readmission Reduction Program Does Not Provide the Right Incentives: Issues and Remedies

Kenan Arifoglu, Assistant Professor, University College London, United Kingdom
Hang Ren, Assistant Professor, George Mason University, United States
Tolga Tezcan, Associate Professor, London Business School, United Kingdom

We study the effectiveness of Hospital Readmission Reduction Program (HRRP), which was recently introduced by Medicare. Using a game-theoretical stylized model, we find that HRRP may induce excess healthcare cost. We propose a new compensation scheme that results in socially optimal efforts in reducing readmissions.

093-0257 Outcomes-Based Reimbursement Policies for Chronic Care Pathways

Saša Zorc, Assistant Professor, Darden School of Business, United States
Stephen Chick, Professor, INSEAD, France
Sameer Hasija, Associate Professor, INSEAD, Singapore

We develop an outcomes-based model of contracting in-care for chronic patients using data from the United Kingdom's NHS. We consider the following obstacles for efficient contracting: disentangling contributions of providers, measurement noise, free-riding, and collusion. We demonstrate that individual outcomes-adjusted capitation contracts are the most resistant to these adverse effects.

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Saturday, 02:15 PM - 03:45 PM, Columbia 6 Track: Healthcare Operations Management

Invited Session: Healthcare Staffing and Work Structure and Patient Outcomes

Chair(s): Masoud Kamalahmadi Alex Mills

093-0092 Effects of Staffing Rotation Patterns on Patients' Length of Stay

Kimia Ghobadi, Assistant Professor, Johns Hopkins University, United States
Retsef Levi, Professor, MIT, United States
Andrew Johnston, Student, MIT, United States
Rhodes Berube, Administrative Director for Clinical Operations, MGH, United States
Walter O'Donnell, Assistant Professor, MGH, United States

We quantify the effects of care-team rotation patterns on patients' length-of-stay in Internal Medicine teams of a large academic medical center. A natural randomized control setting is identified based on the care-teams' schedule. The results indicate a longer length-of-stay when the care-teams rotate shortly after a patient's admission.

093-0249 The Impact of Facility Layout on Service Worker Behavior: A Study of ED Nurses

Lesley Meng, Student, The Wharton School, United States
Robert Batt, Assistant Professor, University of Wisconsin-Madison, United States
Christian Terwiesch, Professor, The Wharton School, United States

We study the impact of service facility layout on how service workers organize their tasks. We focus on the hospital emergency department as a service setting where nurses (servers) have discretion over how they interact with their patients (customers) in a facility that introduces significant heterogeneity in walking distance.

093-0364 Positional Flexibility and Consistent Assignment in Long-Term Care Staffing

Vincent Slaugh, Assistant Professor, Cornell University, United States
Alan Scheller-Wolf, Professor, Carnegie Mellon University, United States

We study the assignment of caregivers to residential households for each shift. We show that prioritizing part-time employees to work in their "home unit" can significantly improve consistency of care. Analysis of one facility's schedules reveals a 40% possible reduction in the number of unique caregivers assigned to each household.

093-0223 Mixing it Up: Operational Impact of Hospitalist Workload

Masoud Kamalahmadi, Student, Indiana University, United States
Alex Mills, Associate Professor, Baruch College, United States
Jonathan Helm, Assistant Professor, Arizona State University, United States
Kurt Bretthauer, Professor, Indiana University, United States

Hospitalists are physicians that specialize in caring for hospital inpatients, replacing a primary care physician who may only make rounds once per day and thereby reducing delays. Given a limited number of hospitalists in a hospital, we seek to determine their optimal service mix (workload and patient types).

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Saturday, 02:15 PM - 03:45 PM, Columbia 7 Track: Supply Chain Management

Contributed Session: Strategic Interactions in Supply Chains

Chair(s): Rongying Chen

093-0532 Online vs Offline: How Should a Supplier Encroach on Its Retailer with Traffic Consideration?

Jie Zhang, Associate Professor, Guang Dong University of Finance and Economics, China

It is increasingly common for suppliers to encroach on its retailer with an online/offline direct channel. In this paper, we investigate a supplier’s decision on whether and how to encroach by considering the traffic congestion cost. We analyze the equilibrium strategies and identify the supplier's channel preference under various conditions.

093-2151 Capacity Investment and Innovation in Supply Chains With Renegotiation

Qiaohai Hu, Assistant Professor, University of Missouri St. Louis, United States

This paper identifies ex ante initial agreements so that the supplier will build specialized capacity and invest in innovation at the channel-efficient level when both the supplier and the buyer anticipate possible ex post renegotiation of the initial agreements after uncertainties have been resolved.

093-1896 Pricing and Procurement Decisions with Partial Ownership Arrangement

Anshuman Chutani, Assistant Professor, University of Nottingham, United Kingdom
Metin Cakanyildirim, Professor, University of Texas Dallas, United States
Varun Gupta, Assistant Professor, Penn State University Erie, United States

We study a one supplier - two retailer supply chain where a retailer holds partial ownership in the common supplier. We determine prices and procurement quantities and study the influence of partial ownership on prices, quantity, and profits of the supplier and the retailers.

093-1499 Cost Sharing in a Shipping Market with Empty Container Repositioning

Rongying Chen, Assistant Professor, Soochow University, China
Ying-Ju Chen, Associate Professor, Hong Kong University of Science and Technology, Hong Kong

Chung-Yee Lee, Professor, Hong Kong University of Science & Tech, China

We study the cost sharing and pricing issue in a shipping market with one carrier and two forwarders. The Stackelberg leader carrier authorizes forwarders to collect cargo at different ports and then transports laden/empty containers. We find that there is a salient conflict between profit maximization and ECR minimization.

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Saturday, 02:15 PM - 03:45 PM, Columbia 8 Track: Supply Chain Management

Contributed Session: Studies on Collaborations in Supply Chains

Chair(s): Guilherme Martins

093-2209 The Serendipitous Benefits of Collaboration

Stanley Fawcett, Professor, Weber State University, United States
Amydee Fawcett, Assistant Professor, Weber State University, United States
A. Knemeyer, Associate Professor, Ohio State University, United States
Sebastian Brockhaus, Assistant Professor, John Carroll University, United States
Yao Jin, Assistant Professor, Miami University, United States

Too often, managers lament that they can't make the case for greater collaboration. They don't have the numbers to justify the efforts. Our longitudinal inductive research shows that managers overlook –i.e., they fail to recognize and quantify– the serendipitous benefits of collaborative initiatives. We present a framework of collaboration benefits.

093-0384 Depicting Collaborations in Microbrewery Supply Chains

Maryam Lotfi, Post Doc/Researcher, Cardiff Business School, United Kingdom
Vasco Rodrigues, Lecturer, Cardiff University, United Kingdom
Maneesh Kumar, Professor, Cardiff University, United Kingdom
Irina Harris, Associate Professor, Ms, United Kingdom
Mohamed Naim, Professor, Cardiff Business School, United Kingdom

We empirically explore, via interviews and focus groups, the preconditions, motivations, and potential areas for collaboration in a national region of the UK microbrewery industry. Findings suggests microbreweries are very open to collaboration, especially in knowledge transfer and internal operations, procurement, NPD, quality assurance, sharing market channels, and logistics.

093-1311 Why and How Should Parcel Courier Logistics Providers Share First-Mile Collection Services?

Xin WANG, Student, the University of Hong Kong, China
George Q. Huang, Professor, The University of Hong Kong, Hong Kong

In this paper, we investigate the outsourcing strategy of parcel courier logistics providers and the price decision of a common service provider which provides shared first-mile door-step collection service for competing logistics providers. Impacts of factors such as the sensitivity of the demand and operation costs are also evaluated.

093-1790 Unpacking Trust Effect on Collaboration and Value Creation in Buyer-Supplier Relationships

Guilherme Martins, Professor, Insper Institute for Education and Research, Brazil
André Duarte, Professor, Insper, Brazil
Raphael Nadruz, Student, Insper Institute for Education and Research, Brazil

This paper investigates if trust based on competence and goodwill differ in promoting collaborative relationships. We use structural equation modeling to analyze data from 200 dyads. Our major finding was that if we analyze collaborative activities that promote value creation, competence-based trust is more relevant than goodwill.

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Saturday, 02:15 PM - 03:45 PM, Columbia 9 Track: Behavioral Operations Management

Invited Session: Judgemental Forecasting as a Tool to Improve Operational Performance

Chair(s): Blair Flicker

093-0652 Sport Obermeyer Revisited: From Point Estimates to Probabilities

Asa Palley, Assistant Professor, Kelley School of Business, United States
Kenneth Lichtendahl Jr., Assistant Professor, Darden School of Business, United States
Yael Grushka-Cockayne, Assistant Professor, Darden School of Business, United States

We develop a procedure that can be used to estimate a predictive distribution using only point estimates from a collection of judges. We find that the approach slightly outperforms the linear opinion pool of full subjective probability distributions from two Surveys of Professional Forecasters.

093-0709 Judgmental Adjustments in Forecasting: Implications and a Strategy for Improvement

Rob Basten, Associate Professor, Eindhoven University of Technology, Netherlands
Bregje Van der Staak, Student, Eindhoven University of Technology, Netherlands
Philippe Van de Calseyde, Assistant Professor, Eindhoven University of Technology, Netherlands
Evangelia Demerouti, Professor, Eindhoven University of Technology, Netherlands
Ton De Kok, Professor, Eindhoven University of Technology, Netherlands

Statistical forecasts are typically checked and often adjusted by human planners. We use data from a company in forecasting services to investigate when adjustments improve forecasts and when they do not. Based on our findings we propose a new way of adjusting forecasts that is more efficient and improves the quality.

093-1876 Interpretation of Contextual Information When Making Judgmental Adjustments in Forecasting

Anna Sroginis, Student, Lancaster University, United Kingdom

Robert Fildes, Professor, Lancaster University, United Kingdom
Nikolaos Kourentzes, Professor, Lancaster University, United Kingdom

Experts frequently adjust statistical forecasts to incorporate additional information. Observing the forecasting process at a UK-retailer, we conduct a laboratory experiment to investigate how experts identify when contextual information has diagnostic value in adjusting statistical forecasts. We find that people tend to misinterpret the information given and over-adjust, harming accuracy.

093-0936 Managerial Insight, "Optimal Algorithms," and Algorithm Aversion

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

In practice, optimal actions prescribed by stylized operational models are often regarded as recommendations. In the lab, I show that this approach (misspecified optimization, then managerial adjustment) performs poorly versus using managerial forecasts as inputs to optimization. However, managers may still deviate from the human-informed recommendations (i.e., "game" the system).

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Saturday, 02:15 PM - 03:45 PM, Columbia 10 Track: Product Innovation and Technology Management

Invited Session: The Impact of the Crowd on Innovation Processes and Outcomes

Chair(s): Cheryl Druehl

093-0119 The Role of Incentive Structure in Innovation Contests

Brian Lee, Assistant Professor, University of Massachusetts - Lowell, United States
Anant Mishra, Associate Professor, University of Minnesota, United States
Shun Ye, Assistant Professor, George Mason University, United States

Innovation contest platforms allow firms to harness solutions to business problems from individuals with diverse backgrounds and specialized skills. Using detailed data from a leading innovation contest platform for data science problems, we examine how the structure of incentives affects the quality and distribution of solutions in innovation contests.

093-1286 Contingent Stimulus in Crowdfunding

Longyuan Du, Assistant Professor, University of San Francisco, United States
Ming Hu, Professor, University of Toronto, Canada
Jiahua Wu, Assistant Professor, Imperial College London, United Kingdom

We study a model where backers arrive sequentially at a crowdfunding project. We characterize the dynamics of the pledging process. To boost success, we propose and characterize stimulus policies including feature upgrade and limited-time offer. Testing with the Kickstarter data, we demonstrate the benefit of the stimulus policies.

093-0264 The Impact of Open Innovation on Operational and Firm Performance

Flora W. W. Cheung, Student, ????, China
Rachel W.Y. Yee, Associate Professor, Institute of Textiles and Clothing, China
Andy C. L. Yeung, Professor, Department of Logistics and Maritime Studies, China

Firms are increasingly prevailing to adopt open innovation (OI) to create a collaborative community for product innovation. However, the impact of OI is under-researched. This research examines the effect of OI on operational performance and the contextual factors that affect this effect using the event study methodology. Implications are drawn.

093-1355 Crowd Voting Systems in Product Innovation: A Literature Review

Liang Chen, Assistant Professor, West Texas A&M University, United States

As open innovation, crowdsourcing, and co-creation are incorporated into the production innovation stage, various crowdvoting systems have been recently adopted by many organizations such as Dell and Toyota. This study reviews existing studies on the design and use of crowdvoting systems in product innovation and provides future research directions.

093-1495 The Impact of Supply Chain-Related Activities on Innovation Performance in Crowdfunding Platforms

Eun Ju Jung, Assistant Professor, George Mason University, United States
Cheryl Druehl, Associate Professor, George Mason University, United States

The global amount raised by crowdfunding platforms reached $34 billion in 2017. However, there has been limited attention given to the impact of supply chain-related activities on entrepreneurs' innovation performance. Using textual analysis, we identify SC activities and investigate the association between each activity and innovation performance.

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Saturday, 02:15 PM - 03:45 PM, Columbia 11 Track: Inventory Management

Invited Session: Inventory Management for Complex Systems

Chair(s): Xiaobei Shen

093-2361 Inventory Hedging Against Demand and Production Time Uncertainties

Yongzhen Li, Assistant Professor, Jinan University, China
miao song, Associate Professor, The Hong Kong Polytechnic University, Hong Kong

This paper considers the production, inventory, and transportation decisions in a multi-item production-distribution network with uncertain demand and production time. We use inventory to hedge against uncertainties and derive bounds on hedging inventory through robust optimization approaches. The computational complexity and total unimodularity are analyzed. Extensive numerical experiments are conducted.

093-0038 Profit Allocation, Decision Sequence and Compliance Aspects of Coordinating Contracts: A Retrospect

Meng Lu, Model Reviewer, The Hongkong and Shanghai Banking Corporation Limited, China
Suresh Sethi, Professor, University of Texas Dallas, United States
Yangyang Xie, Assistant Professor, University of Science and Technology of China, China

Houmin Yan, Professor, City University of Hong Kong, China

We systematically review the profit allocation, decision sequence, and compliance aspects of coordinating contracts. We propose the notion of sample-path flexibility in profit allocation, demonstrate properties and sufficient conditions for these aspects, develop a framework for contract classification, and provide steps for designing sample-path flexiblity and voluntary compliant coordinating contracts.

093-0635 An Order-Dependent Decomposition Approach for Capacitated Multi-Echelon Inventory Systems

Xiaobei Shen, Associate Professor, Univ Sci & Technol China, China
Yimin Yu, Assistant Professor, City University of Hong Kong, Hong Kong
Yue Wang, Student, University of Rochester, United States
Tim Huh, Professor, University of British Columbia, Canada

We consider optimal inventory replenishment policies for capacitated multi-echelon inventory systems. We introduce the notion of order-dependent decomposition and show that the optimal decisions can be made sequentially from the downstream stages first in each period. For each stage, an order-dependent echelon base stock policy is optimal.

093-0634 Managing Multi-Echelon Supply Chains with Guaranteed Service and Expediting

Xiaobei Shen, Associate Professor, Univ Sci & Technol China, China
Yimin Yu, Assistant Professor, City University of Hong Kong, Hong Kong
Jeannette Song, Professor, Duke University Durham, United States

We consider the optimal coordination of inventory ordering, allocation, and expediting in a multi-echelon supply chain with delivery time guarantees. We show that an echelon base stock policy (a rationing policy) is optimal for ordering (allocation and expediting). We provide an efficient algorithm to obtain the state-dependent optimal policies.

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Saturday, 02:15 PM - 03:45 PM, Columbia 12 Track: Service Operations

Contributed Session: Service Research in Education Operations

Chair(s): Barry Cross

093-0239 Productivity Improvement in a Service Organization by Implementing an Academic Management System

Nambirajan Thangasamy, Professor, Pondicherry University, India
Justin Joy, Student, Pondicherry University, India

This study aims to improve the productivity of a service organization, namely an academic institute, by gauging the impact of memos and training on their Academic Management System usage. Statistical tools, namely analysis of variance, Duncan's multiple range test, independent and paired-samples, and t-tests are used for investigating their statistical significance.

093-2336 A Customer's Perspective to Scripting Alignment

Liana Victorino, Associate Professor, University of Victoria, Canada
Mike Dixon, Assistant Professor, Utah State Univ, United States
Don Wardell, Professor, University of Utah, United States
Rohit Verma, Professor, Cornell University, United States

In this service design study, we use a scenario-based experiment to examine scripting alignment. We assess how alignment between expectations and scripting approach and alignment in scripting approach across encounters influences customer perceptions. Other considerations factored into the study include the timing of alignment and the encounter process type.

093-0525 Your Customers are Changing. Are you?

Barry Cross, Assistant Professor, Queens University, Canada

Significant market, demographic and technology elements are driving unprecedented change in today's business. This session discusses concepts and in-class tools that foster new perspectives and student enthusiasm, and includes an in-session activity.

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Saturday, 02:15 PM - 03:45 PM, Monroe Track: Purchasing and Supplier Management

Invited Session: Panel: CAPS Showcase 1

Chair(s): Thomas Choi

093-2414 CAPS Showcase 1

Thomas Choi, Professor, Arizona State University Tempe, United States
John Gray, Associate Professor, Ohio State University, United States
Robert Handfield, Professor, North Carolina State University, United States
Janet Hartley, Professor, Bowling Green State University, United States
Kevin Linderman, Professor, University of Minnesota, United States

CAPS Research conducts practical research requested by CPOs or CSCOs of its members. It recruits researchers from various universities with requisite expertise. In this session, researchers will present their recent projects, so the audience will get an overview of the type of leading-edge issues large Fortune-500 companies grapple with.

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Saturday, 02:15 PM - 03:45 PM, Lincoln East Track: Empirical Research in Operations Management

Contributed Session: Service Operations Management

Chair(s): Kevin Burnard

093-0052 A Holistic Approach for Assessing Quality in Higher Education Institutions

Nidal Dwaikat, Post Doc/Researcher, Royal Institute of Technology (Kth), Sweden

This paper proposes a holistic model for assessing the quality of academic programs in higher education institutions (HEIs). PLS-SEM technique is utilized to empirically test the proposed model and hypothesis. The paper provides a holistic view in which it integrates input, process, and output perspectives in a conceptual model.

093-1137 Go Wide or Go Deep? Assortment Strategy and Order Fulfillment in Online Retail

Sanjith Gopalakrishnan, Student, University of British Columbia, Canada
Moksh Matta, Student, University of British Columbia, Canada
Mona Imanpoor Yourdshahy, Student, Sauder School of Business, UBC, Canada

Operational management of assortment variety introductions is critical in an online retail context. We employ an extensive e-commerce dataset to identify the impacts of a retailer's assortment strategy, measured along the two dimensions of assortment width and depth, on its order fulfillment performance, and its subsequent impact on future sales.

093-0563 Combining Efficiency and Resilience in Information Technology Consulting Services

Ben schneider, Student, IE Universidad, Spain
Elena Revilla, Professor, IE Universidad, Spain
Pablo Lavado, Professor, Universidad del Pacífico, Peru

While existing literature has focused on the trade-off between efficiency and resilience, we develop a framework in which lean- and-risk management-oriented practices are strategically bundled to improve both efficiency and resilience. To test our hypotheses, we relied on a consulting service project database collected from a global IT company.

093-0012 Developing a Case Study Protocol to Support Case Research

Kevin Burnard, Assistant Professor, Western Connecticut State University, United States

This paper outlines the development of case study protocols towards supporting improved reliability. Based on a review of relevant literature, this research outlines the use of validity and reliability measures within operations management research. Following this review, the features of a robust case study protocol are outlined and discussed.

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Saturday, 02:15 PM - 03:45 PM, Lincoln West Track: Empirical Research in Operations Management

Invited Session: Empirical Research in Product Recalls

Chair(s): George Ball

093-0023 The Influence of Female Board Representation on Product Recall Decisions

Kaitlin Wowak, Assistant Professor, University of Notre Dame, United States
George Ball, Assistant Professor, Indiana University Bloomington, United States
Corinne Post, Associate Professor, Lehigh University, United States
Dave Ketchen, Jr., Professor, Auburn University, United States

We theorize that boards influence how firms decide to recall defective products and propose that as the proportion of female directors on a board increases, firms recall more products and do so faster. Using data on 4,271 recalls over a 12-year period, we find support for our theorizing.

093-0800 Technology Life Cycle, Firm Actions, and Product Recalls

Ujjal Mukherjee, Assistant Professor, University of Illinois Urbana-Champaign, United States

In this paper we analyze the impact of technology life cycle on product recalls. Further, we analyze the moderating impact of firm actions related to product and process changes on the relationship between technology life cycle and product recalls.

093-0764 When the Public Takes the Driver's Seat: Twitter Sentiment and Recall Timeliness

Christoph Schmidt, Student, Eth Zurich, Switzerland
David Wuttke, Assistant Professor, Ebs Business School, Germany
George Ball, Assistant Professor, Indiana University Bloomington, United States

We extend the literature on automotive recalls by examining how social media sentiment may shape the timing of a firm's quality decisions. Using a recurrent event Cox model, we find that negative Twitter sentiment increases the hazard of a recall, while positive Twitter sentiment decreases the hazard.

093-0165 Inspecting the Inspectors: The Influence of Gender and Customer Closeness on Product Quality Escapes

George Ball, Assistant Professor, Indiana University Bloomington, United States
Pettis Kent, Assistant Professor, Loyola University of Chicago, United States

We present results of a behavioral experiment investigating factors that influence quality escapes from an inspection process. We determine if men and women are equally likely to allow product quality mistakes to escape an inspection step and how exposure to the actual customer directly or indirectly influences quality escapes.

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Saturday, 02:15 PM - 03:45 PM, Jefferson East Track: Panels & Meetings

Contributed Session: Doctoral Consortium 2

Chair(s): Ozge Sahin

093-2431 Doctoral Consortium 2

Ozge Sahin, Associate Professor, Johns Hopkins University, United States

This session is by invitation only for those doctoral students who have registered. The purpose of the POMS Doctoral Consortium is to help doctoral students maximize their chances of having a successful academic career.

Saturday, 02:15 PM - 03:45 PM

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Saturday, 02:15 PM - 03:45 PM, Georgetown East Track: Supply Chain Risk Management

Contributed Session: Empirical Supply Chain Risk Management

Chair(s): Woohyun Cho

093-2342 Dynamics of Supply Disruption and Recovery: A Case Study From the Locomotive Manufacturing Sector

Shivraj Kanungo, Associate Professor, George Washington University, United States

AMP's new supplier, HF, was ill-equipped to identify manufacturing errors. This case study employs causal loops diagrams to scrutinize the dynamics associated with product failures and and how those product quality risks were contained. We conclude by discussing how AMP could have mitigated much of this supplier-related quality risk.

093-1731 Recovery of Manufacturing Sectors in Puerto Rico Post-Hurricane Maria: Assessing Disruption to Socio-Technical Systems

Jennifer Helgeson, Research Economist, National Institute of Standards and Technology, DOC, United States

The NIST Manufacturing Extension Partnership in Puerto Rico conducted two survey waves of manufacturers following Hurricane Maria. The methodology and preliminary findings are presented for this region where supply chain resilience is vital. Data relates to operational and infrastructure damage causing sales and payroll losses across manufacturing sectors.

093-0761 Disruption Warning Signal Attributes' Effect on Firm Performance: Evidence from National Hurricane Center and Airlines

Rahul Pandey, Student, Ohio State University, United States
Hyunwoo Park, Assistant Professor, Ohio State University, United States
Johnny Rungtusanatham, Professor, Ohio State University, United States

We explore association of attributes of disruption warning signal and disruption trigger on firm performance. We investigate effect of timing and quality of information regarding a hurricane's likelihood of hitting an airport and information regarding variation in hurricane characteristics on airlines' on-time performance and decision to cancel flights.

093-2126 Mitigation of Disruption Impacts on Supply Chain Networks with Fairly Distributed Unmet Demands

Mastoor Abushaega, Student, University of Oklahoma, United States
Andres Gonzalez, Assistant Professor, University of Oklahoma, United States
Theodore Trafalis, Professor, University of Oklahoma, United States

Disruptive events among supply chain networks (SCNs) could hinder the SCN performance and result in considerable unmet demands, leading to customers dissatisfactions. To meet customers' needs, we developed a mixed integer programming model to distribute the unmet demand fairly among all customers, while guaranteeing minimum service levels across the SCN.

093-2365 An Empirical Examination of Bargaining Power and its Impacts on Supply Chain Performance

Woohyun Cho, Associate Professor, University of New Orleans, United States
Jian-Yu Ke, Assistant Professor, California State University Dominguez Hills, United States
Chaodong Han, Assistant Professor, Towson University, United States

We empirically examine how resource dependence among vertical partners may be bargained away through cash-conversion-cycles. We found that a focal firm gets compensated for its resource contribution with bargaining power over partners. Nevertheless, the focal firm may restrain its bargaining power when the need for collaboration with its partners prevails.

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Saturday, 02:15 PM - 03:45 PM, Georgetown West Track: Teaching/Pedagogy in POM

Invited Session: Panel: Supply chain analytics curriculum/course design

Chair(s): Yao Zhao

093-2373 Supply Chain Analytics Curriculum/Course Design

Yao Zhao, Professor, Rutgers University, United States
Rashmi Sharma, Student, Penn State University University Park, United States
Weiwei Chen, Associate Professor, Rutgers Business School, United States
Melissa Bowers, Associate Professor, University of Tennessee Knoxville, United States
Nick Vyas, Assistant Professor, University of South California, United States

In this panel, we invite several leading supply chain management programs to share their insights of integrating analytics into the supply chain management curriculum and courses, their successful stories and lessons learnt.

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Saturday, 02:15 PM - 03:45 PM, Cabinet Track: Sustainable Operations

Invited Session: Topics in Sustainable Operations (2)

Chair(s): Aditya Vedantam

093-0396 Evaluating Profitability of Remanufacturing Operations

Akshay Mutha, Assistant Professor, University of Vermont, United States
Saurabh Bansal, Assistant Professor, Penn State University University Park, United States
Daniel Guide, Professor, Penn State University University Park, United States

We compare different methods for evaluating profitability of remanufacturing operations. We show the application of our model to current industry practices.

093-0632 Product Design and Waste Management Firm Operations

Avinash Geda, Student, University of Florida, United States

Vashkar Ghosh, Assistant Professor, University of North Carolina Greensboro, United States
Gulver Karamemis, Assistant Professor, University of Rhode Island, United States
Asoo Vakharia, Professor, University of Florida, United States

With China recently banning import of recyclable waste generated in the United States (US), recycling firms across the US are facing the problem of warehouses filled with recyclables. In light of this, we ask how product design in terms of recycled/recyclable content impacts the operations of a waste management firm.

093-1798 Probabilistic Selling for Modeling Buyers' Uncertainty in Remanufactured Products Market

Behzad Esmaeilian, Lecturer, Western New England University, United States
Jianzhou Qi, Student, University at Buffalo, SUNY, United States
Sara Behdad, Assistant Professor, University at Buffalo, SUNY, United States

Probabilistic or opaque selling is a sale in which sales outcomes or product features are not revealed to buyers until the purchase is made. This study investigates the concept of probabilistic selling in the remanufacturing market in which consumers are uncertain of products' condition until after they make their purchase.

093-1060 Capacity Investment Strategies for Hybrid Manufacturing/Remanufacturing Systems: The Choice Between Shared and Dedicated Resources

David Francas, Professor, Hochschule Heilbronn, Germany
Stefan Minner, Professor, Technische Universitat Munchen, Germany
Miray Öner Közen, Post Doc/Researcher, Technische Universitat Munchen, Germany

We study capacity investment decisions under random demand and return into any combination of shared (flexible) and (re) manufacturing dedicated resources. We analytically derive optimal capacity investment policies and provide structural sensitivity results. We find that cases exist in which increasing correlation between demand and returns lowers the expected profit.

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Saturday, 02:15 PM - 03:45 PM, Intl Ballroom East Track: Supply Chain Analytics

Invited Session: Learning Uncertainty and Data-driven Policies

Chair(s): Karthik Murali

093-0437 Data-Driven Priority Policies to Enhance Customer Service and Revenue Opportunities Using Past Customer Interaction Information

Brett Hathaway, Student, University of North Carolina Chapel Hill, United States
Seyed Emadi, Assistant Professor, University of North Carolina Chapel Hill, United States
Vinayak Deshpande, Professor, University of North Carolina Chapel Hill, United States

Using data from a banking call center, we show how managers can reduce waiting times and increase sales opportunities by predicting caller abandonment and redialing behavior based on their history with the call center and then prioritizing callers based on the predictions.

093-0932 Stocking Under Uncertain Demand and Product Variety

Vashkar Ghosh, Assistant Professor, University of North Carolina Greensboro, United States
Anand Paul, Associate Professor, University of Florida, United States
Lingjiong Zhu, Assistant Professor, Florida State University, United States

We analyze the optimal stocking policy for a retailer, in a set-up with an arbitrary number of product variants of a single product, stochastic demand, and two-level consumer choice. We model and solve the problem in a benchmark single-period setting and in an infinite horizon setting.

093-1782 Customer Learning and Demand Prediction for Online Durable Goods: Insights and Operational Implications

Clark Pixton, Assistant Professor, Brigham Young University, United States
David Simchi-Levi, Professor, Massachusetts Institute of Technology, United States

Motivated by data from a large online retailer, we study online sales of durable goods, focusing on uncertainty about product quality, the customer-review enabled learning process, and substitution effects in large product categories. We discuss implications for new product introduction and dynamic pricing.

305

Saturday, 04:00 PM - 05:30 PM, Piscataway Track: Energy Supply Chains

Invited Session: Pricing in Energy Markets

Chair(s): Asligul Duran Ozge Islegen

093-0233 A Free Environmental Lunch? The Impact of Environmental Management Systems on Energy Efficiency

Seongkyoon Jeong, Student, Arizona State University, United States
Jaeseok Lee, Lecturer, The University of Auckland, New Zealand

Using fourteen years of plant-level panel data, this study shows that the adoption of ISO 14001, the representative EMS standard, decreases energy efficiency by approximately 4%. The results suggest two main mechanisms of the unintended consequence. More importantly, we find that process management capability alleviates the negative impact.

093-1242 Data-Driven Generator Maintenance and Operations Scheduling Under Uncertainty

Beste Basciftci, Student, Georgia Institute of Technology, United States
Shabbir Ahmed, Professor, Georgia Institute of Technology, United States
Nagi Gebraeel, Professor, Georgia Institute of Technology, United States

This paper aims to effectively model and solve the maintenance and operations scheduling problem of a fleet of generators under unexpected failures. We propose a data-driven approach by considering degradation of the generators. Our results demonstrate the effectiveness of the proposed approach with significant cost savings and reductions in failures.

093-1274 Overbooking in Network Energy Storage

Selva Nadarajah, Assistant Professor, University of Illinois at Chicago, United States
Danial Mohseni Taheri, Student, University of Illinois at Chicago, United States
Theja Tulabandhula, Student, University of Illinois at Chicago, United States

Energy storage assets are critical to match supply and demand but often underutilized. Motivated by an ethanol merchant, we study the overbooking of capacity in a network of energy storage assets. We shed light on the benefits and risks of this practice and provide decision tools to set overbooking levels.

093-1347 Electricity Demand-Response Programs: What is the Right Baseline?

Vishal Agrawal, Associate Professor, Georgetown University, United States
Safak Yucel, Assistant Professor, Georgetown University, United States

Demand response refers to the programs of utility firms under which customers are compensated to reduce their electricity demand as compared to an administratively set baseline. We study how different baseline designs affect the success of a demand response program by accounting for customers' participation and demand-shifting decisions.

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Saturday, 04:00 PM - 05:30 PM, Oak Lawn Track: Marketing and Operations Management

Invited Session: Pricing and Inventory in Marketing and Operations Management

Chair(s): Xiaohang Yue

093-0818 Bayesian Quantile Regression Model for the Price-Setting Newsvendor Problem

Mahsa Mardikoraem, Student, University of Wisconsin - Milwaukee, United States

Quantile regression has been considered for estimating demand in price-setting newsvendor problems. In order to incorporate uncertainty about the model, we use Bayesian quantile regression. Our model provides predictive distributions for the optimal quantile of the demand and the expected profit given price. Implementation involves censored data and model selection.

093-0874 A Bayesian Stochastic Frontier Model of Firm's Productivity

Jessie Nouri, Student, 1990, United States

Stochastic Frontier Model (SFM) is a regression with the ability to capture variations of production across various firms. This research develops a semi-parametric Bayesian SFM for predicting the productivity index across production lines within one firm. The distribution of efficiencies is modeled with mixture Gamma and Log-Normal priors.

093-2110 Optimal Procurement Contracts Under Hidden Information and Actions About Supply Disruptions

Xi Shan, Student, University of Texas Dallas, United States
Chenglin Zhang, Post Doc/Researcher, Southern Methodist University, United States
Suresh Sethi, Professor, University of Texas Dallas, United States

We consider a single period problem where a buyer sources from a supplier whose reliability is private information and, therefore, the supplier's effort to improve reliability is unobservable (hidden action). We study the buyer's optimal procurement contracts.

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Saturday, 04:00 PM - 05:30 PM, Northwest Track: Information Systems and Operations Management

Contributed Session: Applying analytical models to solve IS/OM problems

Chair(s): Sanjith Gopalakrishnan

093-1558 Tech Firms' Coopetition Strategy in the Presence of Network Effects

Chao Ding, Assistant Professor, The University of Hong Kong, China

We build a game theoretical model to analyze the competition strategy of two competing tech firms, both smart device producers and service providers, in the presence of network effects in their services.

093-1302 Tabu Search Guided by Reinforcement Learning for the Max-Mean Dispersion Problem

Dieudonné Nijimbere, Student, Northwestern Polytechnical University, China
Songzheng Zhao, Professor, Northwestern Polytechnical University, China
Wang Yang, Assistant Professor, Northwestern Polytechnical University, China
Xunhao Gu, Student, Northwestern Polytechnical University, China

We present the first hybrid metaheuristic of combining reinforcement learning with tabu search algorithm (RLTS) for solving the max-mean dispersion problem using a dedicated Q-learning mechanism to locate promising regions when tabu search gets trapped in local optimum. The RLTS algorithm performs much better than state-of-the-art algorithms in the literature.

093-1186 To Share or Not to Share? Role of Modularity on Information Sharing in Network Standardization

Sanjith Gopalakrishnan, Student, University of British Columbia, Canada
Moksh Matta, Student, University of British Columbia, Canada
Hasan Cavusoglu, Associate Professor, University of British Columbia, Canada

IT standardization is defined as the network-wide implementation of common processes for informational exchange (e.g., blockchains, data interchange standards). Using a game-theoretic framework, we demonstrate the deleterious effects of heterogeneity in the technological modularities of partner firms via opportunistic information withholding, during the process of network standardization.

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Saturday, 04:00 PM - 05:30 PM, Morgan Track: Public Sector Operations Management

Invited Session: Public Sector OM Research: A Panel Discussion

Chair(s): Gemma Berenguer

093-2216 Public Sector OM Research: A Panel Discussion

Gemma Berenguer, Assistant Professor, Purdue University, United States
Edward Anderson, Professor, University of Texas Austin, United States
Nitin Joglekar, Associate Professor, Questrom School of Business, United States
Jayashankar Swaminathan, Professor, University of North Carolina Chapel Hill, United States
Beril Toktay, Professor, Georgia Institute of Technology, United States
Vedat Verter, Professor, Mcgill University, Canada

Leading OM scholars will share their views on various interesting OM research topics related to Public Sector OM. During the session we will discuss what is Public Sector OM research, how is this research different from other sectors' research, major operational challenges, and most interesting research and teaching topics

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Saturday, 04:00 PM - 05:30 PM, Kalorama Track: Emerging Topics in Operations Management

Invited Session: Sustainable Operations Management of Energy and Natural Resources

Chair(s): Kwon Gi Mun Jiyong Eom

093-0787 Generation Expansion Planning Considering Health and Societal Damages – A Simulation-Based Optimization Approach

Mark Rodgers, Assistant Professor, Rutgers Business School, United States

In this paper, a simulation-based, metamodeling approach is leveraged to quantify health damages associated with power grid expansion decisions by linking the outputs of generation expansion planning simulations with a screening tool that quantifies the human health damages from the electricity sector.

093-1257 Water-Risk Issues in Sustainable Supply Chain Management

Maximiliano Udenio, Assistant Professor, KU Leuven, Belgium
Jan Fransoo, Professor, Kuehne Logistics University, Germany

In this talk we discuss water-risk in supply chains and the challenges in quantifying it. We introduce our water-risk screening framework for SCM and discuss current and future developments.

093-2455 Prioritizing and Sequencing Wastewater Treatment for River-Basin in Developing Countries

Kwon Gi Mun, Assistant Professor, Fairleigh Dickinson University, United States
Jiyong Eom, Associate Professor, Kaist College of Business, South Korea
Yao Zhao, Professor, Rutgers University, United States

Designing wastewater supply chains for riparian states has become a highly controversial policy issue because of their asymmetric externality relationships and vulnerability positions. The problem is particularly pronounced in low-income countries facing tight public budgets and development uncertainties. We develop the concept of wastewater management for riparian states by proposing

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Saturday, 04:00 PM - 05:30 PM, Jay Track: Emerging Topics in Operations Management

Invited Session: Empirical Research on Emerging Topics

Chair(s): Qiuping Yu

093-0649 Operational Transparency: Showing When Work Gets Done

Robert Bray, Associate Professor, Northwestern University, United States

I study how customers respond to operational transparency with parcel delivery data from Cainiao Network, the logistics arm of Alibaba. I show that customers punish early idleness less than late idleness leaving higher delivery service scores when track-package activities cluster toward the end of the shipping horizon.

093-0672 Impact of Machine Learning-Based Price Promotion - Evidence from a Field Experiment

Hongyan Dai, Associate Professor, CUFE, China
Baile Lu, Student, Zhejiang University, China
Yuqian Xu, Assistant Professor, University of Illinois Urbana-Champaign, United States
Weihua Zhou, Professor, Zhejiang University, China

In this paper, we discuss the impact of machine learning-based personalized discount promotion on consumer consumption behaviors. We further analyze the types of consumers who are more likely to adopt such promotions.

093-0934 Initial and Ongoing Trust in Public Sector Relational Contracts

Samantha Keppler, Assistant Professor, University of Michigan Ann Arbor, United States
Karen Smilowitz, Professor, Northwestern University, United States
Paul Leonardi, Professor, University of California Santa Barbara, United States

Relational contracts assume trust between firms, but trust is not solely between firms - it is also between people across firm boundaries. Using a qualitative, multiple-case study approach, this work identifies when and how interpersonal trust ought to be incorporated in models of relational contracts.

093-1093 Dynamic Pricing of the Ride Sharing Market in a Spatial Search Model

Jingting Fan, Assistant Professor, Penn State University State College, United States
Wenlan Luo, Assistant Professor, Tsinghua University, China
Liu Ming, Assistant Professor, Chinese Univ of Hong Kong (Shenzhen), China
Weiming Zhu, Assistant Professor, I E S E, Spain

We build a spatial search model to study the geographic dynamics among drivers. Utilizing data from a leading ride-sharing platform, we assess the impact of different pricing schemes on drivers' capacity distribution, platform profit, and consumer surplus.

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Saturday, 04:00 PM - 05:30 PM, Holmead East Track: Behavioral Operations Management

Invited Session: Modeling Behavioral Issues in Service and Supply Chain Management

Chair(s): Tingliang Huang Hang Ren

093-1281 Vertical Probabilistic Selling Under Competition: The Role of Consumer Anticipated Regret

Yong Chao, Assistant Professor, University of Louisville, United States
Lin Liu, Assistant Professor, University of Central Florida, United States
Dongyuan Zhan, Assistant Professor, University College London, United Kingdom

Consumers are likely to regret purchasing random products when they obtain the less desirable alternative. We show that this anticipated regret works to the advantage of merchants that offer random products due to reverse quality discrimination which enlarges the perceived quality differentiation between the competing firms and softens competition.

093-1536 Empirically Estimating Strategic Behavior for Hotel Standby Upgrade Programs

Ovunc Yilmaz, Assistant Professor, University of Notre Dame, United States
Mark Ferguson, Professor, University of South Carolina, United States
Pelin Pekgun, Associate Professor, University of South Carolina, United States
Guangzhi Shang, Assistant Professor, Florida State University, United States

Using a major hotel chain's 16-month booking data, we empirically investigate the strategic behavior in the context of standby upgrades, a popular program offering availability-based, discounted premium room upgrades to customers.

093-2366 Team Decision Making in Operations Management

Jiawei Li, Student, University of Michigan - Ann Arbor, United States
Damian Beil, Professor, University of Michigan, United States
Stephen Leider, Associate Professor, University of Michigan Ann Arbor, United States

We consider how teams make operations decisions in two canonical settings: standalone Newsvendor inventory decisions (tactical decision-making) and Newsvendor under information sharing. We find that teams perform worse than individuals when making Newsvendor decisions and are more strategic in the information sharing game.

093-0744 The Impact of Social Learning on Consumer Subsidies for Green Technology Adoption

Hang Ren, Assistant Professor, George Mason University, United States
Tingliang Huang, Assistant Professor, Boston College, United States
Georgia Perakis, Professor, Massachusetts Institute of Technology, United States

To incentivize consumer adoption of expensive green-tech products, governments typically offer consumers subsidies through rebates and tax credits. Apart from subsidies, consumers' adoption decisions are usually also influenced by word-of-mouth information about product quality from earlier adopters. We study a government's optimal dynamic subsidy decision with social learning.

312

Saturday, 04:00 PM - 05:30 PM, Holmead West Track: Finance and Operations Management

Invited Session: Blockchains in OM and Finance

Chair(s): Volodymyr Babich

093-0060 Blockchain Adoption for Combating Deceptive Counterfeits

Hubert Pun, Associate Professor, University of Western Ontario, Canada
Swaminathan Jay, Professor, University of North Carolina Chapel Hill, United States
Pengwen Hou, Student, Tianjin Uinversity, China

We consider a market that consists of a manufacturer and a deceptive counterfeiter. The manufacturer can either use blockchain or signal through pricing to validate product authenticity. However, customers have privacy concerns around blockchain usage. We find that blockchain should be used when customers have intermediate distrust about products.

093-0610 How Does Traceability of Blockchain Change Multitier Food Supply Chains?

Lingxiu Dong, Professor, Washington University St Louis, United States
Puping Jiang, Student, Washington University St Louis, United States
Fasheng Xu, Student, Washington University St Louis, United States

Blockchain provides traceability and transparency which facilitate the supply chain to reduce waste during food contamination (e.g., E. Coli outbreaks). While people are excited by its promised benefits, it is not clear when such technology should be adopted and who really benefits from the adoption in multitier food supply chains.

093-0670 Blockchain Design for Supply Chain Management

Jasmine (Aichih) Chang-Shi, Student, Rutgers University, United States
Michael Katehakis, Professor, Rutgers University, United States
Benjamin Melamed, Professor, Rutgers University, United States
Jim (Junmin) Shi, Associate Professor, Tuchman School of Management, United States

We investigate the influence of Blockchain Technology (BCT) on Supply Chain Management (SCM), using a stochastic model, for a manufacturer that seeks to maximize the total expected discounted profit by jointly managing (i) blockchain design, (ii) production or ordering decisions, and (iii) dynamic pricing. We discuss analytical insights thus obtained.

093-2015 Platform Tokenomics

Jiri Chod, Associate Professor, Boston College, United States
Nikos Trichakis, Associate Professor, MIT, United States
S. Alex Yang, Associate Professor, London Business School, United Kingdom

We consider a dynamic model of a platform that matches buyers and sellers, and identifies a double-sided moral hazard that arises between the platform owner and users. We show that the resulting agency cost can be sometimes, but not always, mitigated by the use of blockchain technology and ICO financing.

313

Saturday, 04:00 PM - 05:30 PM, Gunston East Track: Humanitarian Operations and Crisis Management

Contributed Session: Material Convergence and Donation Management

Chair(s): Zhijie Dong

093-1821 Value Function Approximation for Last-mile Distribution in Humanitarian Relief

Robert Cook, Assistant Professor, Northeastern Illinois Univ, United States
Emmett Lodree, Associate Professor, University of Alabama Tuscaloosa, United States

This study describes a Value Function Approximation approach for solving a Markov Decision Problem in which we distribute stochastically-arriving donations to disaster survivors. Donations accumulate over time at collection sites and are periodically transported to a relief center where the donations are distributed to beneficiaries over a finite horizon.

093-2257 Policy Analysis of Material Convergence Challenges During Disasters

Raquel Froese Buzogany, Student, University of Lugano, Switzerland
Paulo Goncalves, Associate Professor, University of Lugano, Switzerland
Hugo Yoshizaki, Associate Professor, Universidade de São Paulo, Brazil

Material convergence poses significant challenges during disasters. This study is the first to map the feedback processes influencing its overall dynamics and to offer a comprehensive analysis on how multiple policies affect the system, shedding light on ways to address the challenges presented by material convergence.

093-2354 Stochastic Modelling in Collection Centers Operations

Irais Mora, Associate Professor, Tecnologico De Monterrey, Mexico
Marco Serrato, Associate Professor, Tecnologico de Monterrey, Mexico
Jaime Mora-Vargas, Associate Professor, Tecnologico De Monterrey, Mexico
Raha Akhavan, Associate Professor, Savanci university, Turkey

In- kind donations' management in the aftermath of a disaster is key in many countries. This research proposes a Markov Decision Model to support decision making in collection centers that receive these donations.

093-0819 Dynamic Supplier Selection in Humanitarian Relief: A Multi-Stage Stochastic Programming Approach

Shaolong Hu, Post Doc/Researcher, Texas State University, United States
Zhijie Dong, Assistant Professor, Texas State University, United States
Jennifer Shang, Professor, University of Pittsburgh, United States

This study focuses on dynamic supplier selection for relief agencies. The duration of supplier contracts vary, mainly depending on minimum commitment quantity, maximum reserve quantity, uncertainty, and dynamic of demand. By using a multi-stage stochastic programming approach we identify strategies of supplier selection to improve efficiency of disaster response.

314

Saturday, 04:00 PM - 05:30 PM, Gunston West Track: Next Generation Operations

Invited Session: Supplier Compliance

Chair(s): Basak Kalkanci

093-0687 Impacts of Distributional Social Comparison Behavior on Corporate Social Responsibility: Power of the Small

Zizhuo Wang, Student, Dalian University of Technology, China
Mingzheng Wang, Professor, Zhejiang University, China
Xin Fang, Assistant Professor, Singapore Management University, Singapore

Motivated by various CSR rankings and awards, we study the impacts of distributional social comparison behavior of firms on CSR in a supply chain. We consider two types of social comparison behavior, ahead seeking and ahead averse, and two types of firms, large enterprises and SMEs.

093-1389 Does Supply Chain Visibility Affect Operating Performance? Evidence From Conflict Minerals Disclosures

Caroline Swift, Student, Penn State University University Park, United States
Daniel Guide, Professor, Penn State University University Park, United States
Suresh Muthulingam, Assistant Professor, Penn State University University Park, United States

Supply chain visibility (SCV) is becoming a popular tool for mitigating risks in supply chains. We use U.S. conflict minerals disclosures to assess the extent of firms' SCV and test its impact on operating performance. We find that firms with higher SCV achieve improved profitability, sales, and market value.

093-1911 The Market Value of Sustainability Disclosure: A Cross-Cultural Field Study

Markko Hamalainen, Post Doc/Researcher, Aalto University, Finland
Tim Kraft, Assistant Professor, Sloan School of Management, United States
Doug Thomas, Professor, University of Virginia, United States
Yanchong Zheng, Associate Professor, Massachusetts Institute of Technology, United States
Meng Zhang, Student, Massachusetts Institute of Technology, United States

Partnering with Goodio, a Finland-based craft chocolate producer, we explore how consumers react to values-based and evidence-based messaging regarding environmental and social initiatives. We test the effects of transparency in three markets (US, Finland, and Japan) with both online and field experiments.

315

Saturday, 04:00 PM - 05:30 PM, Fairchild East Track: POM in Practice

Invited Session: Retail and Supply Chain

Chair(s): Yugang Yu

093-0346 Revisiting the Common Retailer Channel: Why Multiple (Asymmetric) Manufacturers Matter

Quan Zheng, Associate Professor, University of Science and Technology of China, China
Xiajun Pan, Assistant Professor, University of Florida, United States
Asoo Vakharia, Professor, University of Florida, United States

While previous studies in a common retailer channel typically consider two manufacturers in the market with similar production costs, each receiving a positive demand from the retailer, we show that both the network size and asymmetry of manufacturers play a pivotal role in manufacturers and retailer decisions.

093-0547 Examining the Halo Effect in Crowdfunding: The Moderating Role of Market Conditions

Zujun Zhu, Student, University of Science and Technology of China, China
Qian Huang, Associate Professor, University of Science and Technology of China, China
Hefu Liu, Professor, University of Science and Technology of China, China

This study draws upon research regarding halo effect in marketing to test a direct effect of extrinsic attributes on crowdfunding performance. We also demonstrate the moderating role of market conditions on platforms. We extract the dataset of 6493 JD Crowdfunding projects from September, 2014 to September, 2017.

093-0830 Resolving Supplier Information Asymmetry: Reliability or Improvement Cost?

Yutian Li, Assistant Professor, University of Science and Technology of China, China
Sammi Tang, Associate Professor, University of Miami, United States

We consider a manufacturer who sources from an unreliable supplier. The supplier can take costly effort to improve reliability, but has private information about either its initial reliability or improvement cost. We examine which types of asymmetric information the manufacture should obtain to better improve the profit.

316

Saturday, 04:00 PM - 05:30 PM, Fairchild West Track: Economics Models in Operations Management

Invited Session: Topics in Economics Models in Operations Management

Chair(s): Muge Yayla-Kullu

093-0783 Joint Improvement Under Interdependent Efforts

Yimin Wang, Assistant Professor, Arizona State University Tempe, United States
Xiangjing Chen, Student, W.P. Carey School of Business, United States

Improving product attributes often requires joint efforts between a supplier and a buyer. We study how interdependencies of the efforts affect the equilibrium outcome of improved product attributes. We give insights on how transfer price and timing of improvement efforts help to achieve better performance.

093-0923 The Impact of Renewable Energy Forecast Errors on Imbalance Volumes and Electricity Spot Prices

Derek Bunn, Professor, London Business School, United Kingdom
Shadi Goodarzi, Assistant Professor, California State University Fullerton, United States

Using data from the German electricity market, we investigate the effect of wind and solar energy forecasts' errors on imbalance volumes and intraday spot electricity prices. We use OLS and quantile regressions and autoregressive moving averages to identify these relationships using variables that have a quarter-hourly data granularity.

093-0738 Reining in Onion Prices by Introducing a Vertically Differentiated Substitute: Models, Analysis, and Insights

Muge Yayla-Kullu, Associate Professor, University of Central Florida, United States
Omkar Palsule-Desai, Assistant Professor, IIM-Ahmedabad, India
Srinagesh Gavirneni, Professor, Cornell University, United States

Onion is an indispensable ingredient of the Indian diet and plays a vital role in the Indian economy, society, and politics. We examine the pricing ordeal in India's onion markets. We discuss the option of introducing a processed substitute and whether it should be managed by non-profits.

317

Saturday, 04:00 PM - 05:30 PM, Embassy Track: Environmental Operations Management

Invited Session: OM for Developing Countries/Emerging Economies

Chair(s): Nur Sunar

093-0261 Optimal Seeding Policy Under Rainfall Uncertainty

Ying (Maggie) Zhang, Assistant Professor, Clemson University, United States
Jayashankar Swaminathan, Professor, University of North Carolina Chapel Hill, United States

We study the optimal seeding policy of a single crop under rainfall uncertainty and show the optimality of the threshold-type policy. Using a real-size problem, we show that the relative yield advantage of the optimal policy over commonly used heuristics increases as the climate condition becomes more severe for planting.

093-1393 Operational Challenges in a Medical Transportation Platform in India

Andre Calmon, Assistant Professor, INSEAD, France
Stef Lemmens, Post Doc/Researcher, INSEAD, France
Gonzalo Romero, Assistant Professor, University of Toronto, Canada
Luk Van Wassenhove, Professor, INSEAD, France

We model and analyze the operational challenges faced by a medical transportation platform in India. In many developing countries, there is no centralized ambulance dispatcher. Therefore, patients must call their local hospital or hire a private ambulance, resulting in long waiting times for patients and costly routes for ambulances.

093-1776 Inconvenience, Liquidity Constraints, and the Adoption of Off-Grid Lighting Solutions

Bhavani Shanker Uppari, Assistant Professor, Singapore Management University, Singapore

We investigate the efficacy of rechargeable lighting models under poverty. In collaboration with a firm in Rwanda, we collected the bulb usage data from randomized experiments. We build a structural model that incorporates the light consumption dynamics and use it to evaluate changes to the existing model.

318

Saturday, 04:00 PM - 05:30 PM, Du Pont Track: Revenue Management and Pricing

Invited Session: Emerging Topics in Pricing and Revenue Management

Chair(s): A. Serdar Simsek

093-0047 A Field Experiment on Airline Lead-in Fares

Maxime Cohen, Assistant Professor, New York University, United States
Alexandre Jacquillat, Assistant Professor, Heinz College of Information Systems and Public Policy, United States
Juan Camilo Serpa, Assistant Professor, Mcgill University, Canada

Commonly, airlines set their lead-in fare by matching competitors. We challenge this practice by partnering with a leading airline and running a field experiment. We propose a multi-control-group experimental design to estimate the treatment effect. Results show that lead-in differentiation can increase revenue and yield significantly (without decreasing market share).

093-1108 Revenue Management in Crowdfunding

Jiding Zhang, Student, The Wharton School, United States
Senthil Veeraraghavan, Professor, Wharton School, University of Pennsylvania,, United States
Sergei Savin, Professor, University of Pennsylvania, United States

We develop a model of crowdfunding dynamics by optimizing both the pledge level sought from donors or backers and the duration of the campaign. Our model aligns with the patterns of backer/donor pledging observed on crowdfunding platforms. We show how campaigns with high goals benefit from uncertainty.

093-1705 Price Equilibrium Under Heteroscedastic Exponomial Choice

Aydin Alptekinoglu, Associate Professor, Penn State University University Park, United States
John Semple, Professor, Southern Methodist University, United States

I will discuss the price equilibrium among an oligopoly of single-product firms under HEC. Theoretical interest is the impact of heteroscedasticity on equilibrium prices, which is new to the discrete choice literature. Empirical interest of the equilibrium is unique and it can be very easily computed.

093-1533 Anticipated Regret During Auctions: Empirical Evidence From eBay

Meisam Hejazi Nia, Senior Data Scientist, HomeAway, United States
Ozalp Ozer, Professor, University of Texas Dallas, United States
Serdar Simsek, Assistant Professor, University of Texas Dallas, United States

We develop a structural model that accounts for bidders' learning and their anticipation of winner and loser regrets in an auction platform. Using a data set from eBay, we quantify the anticipation of regret and show how our results can be used to increase eBay's revenue significantly.

319

Saturday, 04:00 PM - 05:30 PM, Cardozo Track: Data Science

Invited Session: POMS - JD.com Data Driven Research Paper Competition II

Chair(s): Zeyu Zheng

093-2476 Forecasting Product Life Cycles Using Exponential Smoothing

Xiaojia Guo, Student, UCL School of Management, United Kingdom
Kenneth Lichtendahl Jr., Assistant Professor, Darden School of Business, United States
Yael Grushka-Cockayne, Assistant Professor, Darden School of Business, United States

Firms need accurate forecasts of product life cycles to make operational decisions. We develop a first of its kind exponential smoothing model with a life-cycle trend. We demonstrate empirically that the model can capture a wide range of skewed diffusions and outperforms leading models in out-of-sample point and quantile forecasting.

093-2474 A Data Analytics Approach to Integrated Location, Assortment and Inventory Planning in Omni-Channel Retail

Jian Chen, Professor, Tsinghua University, China
Yong Liang, Associate Professor, Tsinghua University, China
Hao Shen, Student, Tsinghua University, China
Zuo-Jun Max Shen, Professor, University of California Berkeley, United States

Observing retailers aggressively expanding in both online and offline channels, we study a data analytics approach enabling omni-channel retailers to optimize location, assortment, and inventory decisions to maximize profits. We develop an efficient reformulation to solve the proposed decision model, and draw interesting observations that can be valuable to practitioners.

093-2475 Estimating Primary Demand in Bike-sharing Systems

Chong Yang Goh, Student, MIT, United States
Chiwei Yan, Student, MIT, United States
Patrick Jaillet, Professor, MIT, United States

We study the problem of estimating the primary origin-destination demand for a bike-sharing service using trip data. To account for choice substitutions, we propose a rank-based demand model and an efficient estimation procedure that is provably consistent. Our approach is practical to implement at a city scale.

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Saturday, 04:00 PM - 05:30 PM, Coats Track: Manufacturing Operations

Invited Session: Competition and Optimization of Supply Chain

Chair(s): Mingzhou Jin

093-2125 Quality and Brand Image Effects on the Competition Between Store and National Brands

Nasser Al Monawer, Student, Rutgers Business School, United States
Mehdi Davoodi, Student, Rutgers Business School, United States
Lian Qi, Associate Professor, Rutgers University, United States

Consumers make their purchase decisions largely depending on the brand image rather than the product quality, especially when it comes to store brands. With the proliferation of store brands, we explore managerial insights regarding competitions between national and store brands along with the collaborations between manufacturers and stores.

093-2200 Optimizing Supply Chain Network Under Trade Credit Financing

Yi Ding, Assistant Professor, Southeast University, Nanjing, China, China

This paper studies supply chain network design which jointly optimizes the warehouses locations, the warehouse-retailer assignments, the multi-echelon inventory replenishment policy, the safety stock decisions, and the trade credit to minimize the total systemwide costs. A polymatroid cutting-plane approach is adopted to solve the MIP model with nonlinear terms.

093-1141 A Method of Identifying Customized MES Demand Based on the Collaboration of Information Systems

Xiaobing Liu, Professor, Faculty of Management and Economics, Dalian University of Technology, China
Xiaoning Cao, Student, Faculty of Management and Economics, Dalian University of Technology, China
Fanghong Xue, Lecturer, Faculty of Management and Economics, Dalian University of Technology, China

In order to avoid business redundancy, this study proposes a demand identification method of customized MES based on information systems collaboration. This collaboration follows the business logic of production process and supports production planning and manufacturing sites. The case shows that customized MES can be effectively connected to other systems.

321

Saturday, 04:00 PM - 05:30 PM, Columbia 1 Track: Scheduling and Logistics

Contributed Session: Logistics in Supply Chain

Chair(s): Nilakantan Narasinganallur

093-1573 Managing the Multi-Node Replenishment Logistics in the Food Supply Chain

Alejandro Vigo Camargo, Student, University of Michigan, United States
Yavuz Bozer, Professor, University of Michigan, United States

The main objective of this study is to develop an optimization model to minimize the cost of the replenishment logistics in the outbound portion of a fast food supply chain by minimizing the distance traveled and trucks needed while meeting service level and capacity limitations.

093-1342 Dynamic Optimization of Shared Inventory Resources

Yi Lu, Student, Peking University, China
Lihua Chen, Professor, Peking University, China

Inspired by Cainiao, a famous logistics company in China, the paper analyzed a dynamic allocation problem for inventory transfer among warehouses and coordinated distribution to markets in consideration of time change. An accurate algorithm and a heuristic algorithm were applied to solve a real problem in Chinese logistics network programming.

093-1865 Impact of Time Window Policies on Supply Chain Costs

Arpan Rijal, Student, Erasmus University Rotterdam, Netherlands
Marco Bijvank, Assistant Professor, University of Calgary, Canada
René De Koster, Professor, Rotterdam School of Management, Netherlands

Sustainability driven time window policies have significant impact on secondary transportation cost for retailers. In this work, we reassess time window policies' impact more holistically. A joint approach that considers warehouse operations and transport planning can mitigate the negative financial impact of time window policies for retailers.

093-0699 Vehicle Routing for Mid-Day Meal Scheme of ISKCON Annamrita

Nilakantan Narasinganallur, Associate Professor, KJ SIMSR, India

We solved a vehicle-routing problem for Annamrita-ISKCON for their mid-day-meal scheme and routing deliveries to different schools in Mumbai. Different sections of the problem were solved and forty percent fuel savings were achieved with appropriate modeling in Excel and solved with Frontline Solver. The presentation will discuss the results and conclusions.

322

Saturday, 04:00 PM - 05:30 PM, Columbia 2 Track: Operational Excellence

Invited Session: Microfoundations of improvement projects: a routine-based view

Chair(s): Ambra Galeazzo

093-1341 Implementation of Process Change: A Mixed Methods Study in Healthcare

Gopesh Anand, Associate Professor, University of Illinois Urbana-Champaign, United States
Aravind Chandrasekaran, Associate Professor, Ohio State University, United States
Luv Sharma, Assistant Professor, University of South Carolina, United States

We studied the implementation of new standard practices for the patient education process in a kidney transplant unit using a mixed methods approach. Statistical results confirm the efficacy of the process change and provide preliminary support for the refinements to conventional organizational learning perspectives proposed based on our case study.

093-1539 When Events Violate Expectations: Learning During Quality Improvement Projects

Adrian Choo, Assistant Professor, Michigan State University, United States
Lawrence Fredendall, Professor, Clemson University, United States
Jamison Kovach, Associate Professor, University of Houston, United States

This research examines how individual learning in group problem solving can occur through situations that conflict with personal and group expectations. Implications regarding improved learning during problem solving activities will be discussed.

093-1654 Continuous Improvement: A Tension Between Performance Management and Social Support

Ambra Galeazzo, Post Doc/Researcher, Universita Degli Studi Di Padova, Italy
Andrea Furlan, Professor, Padova University, Italy
Andrea Vinelli, Professor, Universita Di Padova, Italy

As literature highlights that employees' support leads to continuous improvement (CI), does it mean that managers should abdicate an authority-driven perspective? We investigate how performance management (a combination of stretch and discipline) and social support (a combination of trust and support) interact to enhance CI and firm performance.

323

Saturday, 04:00 PM - 05:30 PM, Columbia 3 Track: Operational Excellence

Invited Session: Lean Six Sigma for Operational Excellence 2

Chair(s): Jiju Antony

093-0689 Reducing Medication Errors Using LSS Methodology in Thai Hospitals

Yaifa Trakulsunti, Student, Heriot-Watt University, United Kingdom
Jiju Antony, Professor, Heriot-Watt University, United Kingdom

Medication error is one of the primary causes of patient mortality that cannot be resolved by healthcare practitioners. Lean Six Sigma is applicable in reducing errors from the medication process. Action research methodology was used to explore the implementation of Lean Six Sigma through the collaboration between the researcher and participants.

093-0696 Continuous Improvement Initiatives for Dynamic Capabilities' Development: A Systematic Literature Review

Leopoldo Gutierrez, Associate Professor, University of Granada, Spain
Jiju Antony, Professor, Heriot-Watt University, United Kingdom

Despite the reputation of initiatives such as Lean Management, Six Sigma, or TQM, their effects on long-term benefits are fraught with controversy. This study performs a systematic literature review on these initiatives and dynamic capabilities development as framework to analyze how firms can sustain their advantage over time.

093-0702 Continuous Improvement Deployment Models: A Review and Propositions for Future Research

Bart Lameijer, Assistant Professor, University of Amsterdam, Netherlands
Jiju Antony, Professor, Heriot-Watt University, United Kingdom
Ronald Does, Professor, University of Amsterdam, Netherlands

This research provides a systematic overview of the available academic- and practitioner- based guidance for continuous improvement deployment in organizations. Based upon the research framework, ultimately 16 CI, deployment models are aggregated into a meta-CI deployment model, which is the basis for scientific grounding and various propositions for future research.

093-0700 Lean Six Sigma Readiness Within a UK Public Utility Sector

Bryan Rodgers, Assistant Professor, Heriot-Watt University, United Kingdom
Jiju Antony, Professor, Heriot-Watt University, United Kingdom

This research has been carried out in an organization preparing to launch a strategic commitment to a Lean Six Sigma initiative. 150 staff participated in the assessment of the organizations' readiness to develop the initiative and identify strengths and necessary improvements to maximise their likelihood of success and sustainability.

324

Saturday, 04:00 PM - 05:30 PM, Columbia 4 Track: Healthcare Analytics

Invited Session: Prediction and Policy Problems in Healthcare

Chair(s): Mehmet Ayvaci

093-0198 Aiding the Prescriber: Sounding the Alarm on Opioids

Margret Bjarnadottir, Assistant Professor, University of Maryland, United States
David Anderson, Assistant Professor, Villanova University, United States
Ritu Agarwal, Professor, University of Maryland, United States
Kislaya Prasad, Professor, University of Maryland, United States
Alan Nelson, Managing Member, Innolytics llc, United States

The ongoing opioid epidemic is a serious public health issue. We investigate the feasibility of early detection of chronic opioid use and build advanced machine learning models that can be incorporated into clinical decision support systems, potentially minimizing adverse events associated with chronic opioid use and dependency.

093-0502 Using Social Determinant to Predict Health Outcomes

Min Chen, Assistant Professor, Florida International University, United States
Rema Padman, Professor, Carnegie Mellon University, United States

We integrate social determinant data into patient level clinical information and examine how this data integration will affect predictive accuracy of health outcomes.

093-1436 How AI Plays its Tricks: Interpreting the Performance of Deep Learning in Predicting Healthcare Costs

Weiguang Wang, Student, University of Maryland, United States
Margret Bjarnadottir, Assistant Professor, University of Maryland, United States
Guodong Gao, Associate Professor, University of Maryland, United States

This study developed and interpreted the superior performance of an LSTM-Based Deep Learning model in healthcare cost prediction. The better performance of the LSTM model compared with five traditional machine learning models was interpreted in three ways: subgroup examination, fluctuation analysis, and model design investigation.

093-1946 Pricing Schemes and Physician Engagement in Physician-Oriented Online Healthcare Community: A Regression Discontinuity Approach

Seyoung Seol, Student, Indiana University Bloomington, United States
Lu (Lucy) Yan, Assistant Professor, Indiana University Bloomington, United States
Jingjing Zhang, Assistant Professor, Indiana University Bloomington, United States
Hillol Bala, Associate Professor, Indiana University Bloomington, United States
Liuan Wang, Student, Harbin Institute of Technology, China

We study how physician engagement changes under different pricing schemes. By examining the effects of an intervention to promote paid consultation service on an online platform, we found that physicians make more effort to attract prospective patients using free service at the expense of their engagement in providing paid service.

325

Saturday, 04:00 PM - 05:30 PM, Columbia 5 Track: Healthcare Operations Management

Invited Session: CHOM Best Paper Competition Finalists

Chair(s): David Dobrzykowski

093-0040 Flexible FDA Approval Policies

Fernanda Bravo, Assistant Professor, UCLA Anderson School of Management, United States
Taylor Corcoran, Student, UCLA Anderson School of Management, United States
Elisa Long, Associate Professor, UCLA Anderson School of Management, United States

The USFDA requires clinical trial evidence that is statistically significant at the 2.5% level when approving drugs, but the agency often uses discretion when interpreting these standards. We propose a queueing model of the drug approval process, which incorporates factors such as disease severity, prevalence, and availability of existing therapies

093-1922 Timing it Right: Balancing In-Patient Congestion versus Readmission Risk at Discharge

Pengyi Shi, Assistant Professor, Purdue University, United States
Jonathan Helm, Assistant Professor, Kelley School of Business, United States
Jivan Deglise-Hawkinson, Analytics, ????, Singapore
Julian Pan, CEO, ????, United States

When to discharge a patient plays an important role in hospital patient flow management as well as quality of care and patient outcomes. In this work, we develop and implement a practical decision support tool to aid hospitals in managing the delicate balance between individual readmission risk and ward congestion.

093-0488 Unintended Consequences of Hospital Regulation: The Case of the Hospital Readmissions Reduction Program

Christopher Chen, Student, London Business School, United Kingdom
Nicos Savva, Associate Professor, London Business School, United Kingdom

We examine the impact of the Hospital Readmissions Reduction Program (HRRP) on hospitals' admission decisions. We find that hospitals exposed to HRRP penalties increased observation admissions, which do not count towards readmissions, by 16.9% compared to non-penalized hospitals, and by as much as 40.6% if they were also financially constrained.

093-0889 Do Hospital Closures Improve the Efficiency and Quality of Other Hospitals?

Lina Song, Student, Harvard University, United States
Soroush Saghafian, Assistant Professor, Harvard University, United States

We study the impact of hospital closures on the surrounding hospitals' efficiency and quality. We find that hospital closure results in improvement in efficiency at nearby hospitals, but there is an unintended negative consequence in quality through a reduction in service duration and an increase in 30 -day mortality.

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Saturday, 04:00 PM - 05:30 PM, Columbia 6 Track: Sustainable Operations

Invited Session: Topics in Sustainable Operations (3)

Chair(s): Natalie (Ximin) Huang

093-0270 Using Transaction Data to Improve Consumer Returns Forecasting

Guangzhi Shang, Assistant Professor, Florida State University, United States
Erin Mckie, Assistant Professor, Ohio State University, United States
Mark Ferguson, Professor, University of South Carolina, United States
Michael Galbreth, Professor, University of Tennessee Knoxville, United States

Although an accurate returns forecast is preliminary for many decision support tools for managing returns, the development methods in this area received relatively little attention. We propose a new approach and benchmark its performance against a number of existing methods using two real world datasets.

093-0274 Utility-Owned Combined Heat and Power and Sustainability

Eric Webb, Assistant Professor, University of Cincinnati, United States
Gilvan Souza, Professor, Indiana University Bloomington, United States
Owen Wu, Associate Professor, Indiana University, United States

Combined heat and power (CHP) plants generate electricity and heat at the same time, which can be used by on-site firms for space and process heating. CHPs have higher efficiency and lower emissions than separate generation. We study the economics of utility ownership of CHP under different regulatory scenarios.

093-0806 Understanding the Choice of Online Resale Channel for Used Electronics

Gokce Esenduran, Assistant Professor, Purdue University, United States
James Hill, Associate Professor, Ohio State University, United States
In Joon Noh, Student, Ohio State University, United States

Individuals can sell their used electronic devices to independent parties, original equipment manufacturers, or other individuals through online marketplaces. To understand the choice among different resale channel alternatives, we conduct a series of discrete choice experiments and estimate sellers' utility functions using multinomial logit models.

093-1021 Pricing in Remanufacturing Operations

Akshay Mutha, Assistant Professor, University of Vermont, United States
Saurabh Bansal, Assistant Professor, Penn State University University Park, United States
Daniel Guide, Professor, Penn State University University Park, United States

We consider a firm that can remanufacture products after the demand is realized. We analyze the effect of postponing remanufacturing operations on the pricing decisions of a firm. We show the application of our model using industry data.

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Saturday, 04:00 PM - 05:30 PM, Columbia 7 Track: Supply Chain Management

Contributed Session: Digitalization, Online Retailing and E-Commerce

Chair(s): Hai Li

093-1926 Impetus for Digital Supply Chain Transformations: The Development of Motivation to Change

Christoph Lennartz, Student, Whu - Otto Beisheim School of Management, Germany
Maria Jesus Saenz, Post Doc/Researcher, MIT, United States
Carl Wallenburg, Professor, Whu - Otto Beisheim School of Management, Germany

Motivation to change is essential for transformations, but how does it develop in digital supply chain endeavors? Analyzing more than 1600 codes through 17 case studies, based on large, international, long-established companies, we identify how motivation drives, via discomfort, learning anxiety, and psychological safety, the stages of this digital transformation.

093-2061 Buying Groceries Online: A PLS-SEM Approach

Rose Antony, Student, National Instituteof Industrial Engineering, Mumbai, India
Vivekanand Khanapuri, Professor, National Instituteof Industrial Engineering, Mumbai, India
Karuna Jain, Professor, National Instituteof Industrial Engineering, Mumbai, India

The antecedents of customer satisfaction in online groceries among Indian consumers are determined using survey research method. Data analysis employing PLS-SEM approach presents the significance of responsiveness, transaction and monetary value, but the non-significance of reliability, product features, and functionality contrast the findings in developed nations' context.

093-1322 Fast Order Picking in Online Fulfillment Warehouses with Explosive Storage

Sevilay Onal, Student, New Jersey Inst of Technology, United States
Jingran Zhang, Assistant Professor, Lewis College of Business, United States
Sanchoy Das, Professor, Mechanical & Industrial Engineering, United States

Online order fulfillment warehouses use an explosive storage policy, whereby the same item is stocked simultaneously in many bin locations anywhere in the warehouse. The picking problem is then defined by two decisions, when to pick and where to pick. A heuristic solution to minimize order delays is presented.

093-0421 To Automate or Not to Automate: That Is the Question for Ecommerce Warehousing

George Q. Huang, Professor, The University of Hong Kong, Hong Kong
Xin WANG, Student, the University of Hong Kong, China
Su Xiu Xu, Professor, Jinan University, China
Mian Yan, Assistant Professor, Jinan University, China
Pak Ki Kwok, Assistant Professor, Jinan University, China

We propose a new business model to ascertain under what circumstances a warehouse operator would outsource the automation service. From the automation provider's viewpoint, we examine the choice of service level and the impact of various negotiation powers.

093-1014 Strategic Analysis of E-Commerce Business Model Selection and Store Brand Introduction

Hai Li, Associate Professor, Zhongnan University of Economics and Law, China

This paper investigates the business model selection and store brand introduction in a supply chain consisting of a national brand manufacturer and an online retailer under different power structures. We comprehensively analyze four different scenarios and obtain the equilibrium decisions of business model strategy and store brand strategy.

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Saturday, 04:00 PM - 05:30 PM, Columbia 8 Track: Supply Chain Management

Invited Session: Strategies and Decision Making in Supply Chains

Chair(s): Yan Dong Sining Song

093-0490 Understanding the Implications of Change Orders in the Automotive Industry

Bilal Gokpinar, Assistant Professor, University College London, United Kingdom
Sriram Narayanan, Associate Professor, Michigan State University, United States

In this study, we provide a nuanced understanding of the multifarious implications of how change orders in manufacturing environments influence plant productivity, product quality, and market performance using a proprietary database. Our findings indicate differential effects based on the source of change orders and different dimensions of performance.

093-0731 Empirical Research About Suppliers' Selection

Kejia Hu, Assistant Professor, Vanderbilt University, United States
Yixin Iris Wang, Assistant Professor, University of Illinois Urbana-Champaign, United States

In this research, we use observational data at the transaction level to understand the relative importance of multiple suppliers' features in attracting deals.

093-0918 Improving Societal Outcomes of Sharing of Farm Equipment in Emerging Economies

Priyank Arora, Assistant Professor, University of Massachusetts Amherst, United States
Adebola Olufunke, Student, Georgia Institute of Technology, United States

Although farm equipment sharing is considered a novel approach for improving societal outcomes in emerging economies, it has not been successful in several African countries. We develop an analytical model to interrelate operational decisions of key stakeholders (equipment manufacturer, local intermediary, government, and farmers) and examine their impact on society.

093-0648 Greenhouse Gas Emissions and Supply Chain Leakage

Sining Song, Assistant Professor, University of Tennessee Knoxville, United States
Yan Dong, Associate Professor, University of South Carolina, United States
Thomas Kull, Associate Professor, Arizona State University Tempe, United States

Craig Carter, Associate Professor, Arizona State University Tempe, United States
Kefeng Xu, Professor, University of Texas at San Antonio, United States

We empirically study how a firm's GHG emissions reduction initiatives may have impacted its supply chain environmental performance and we further explore the mechanisms through which the impact may have occurred.

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Saturday, 04:00 PM - 05:30 PM, Columbia 9 Track: Behavioral Operations Management

Invited Session: BOM Junior Scholar Paper Competition Finalist Presentations

Chair(s): Kyle Hyndman

093-2463 Strategically Giving Service: The Effect of Real-Time Information on Service Efficiency

Nil Karacaoglu, Student, Kellogg School of Management, United States
Antonio Moreno, Associate Professor, Harvard University, United States
Can Ozkan, Student, Northwestern University, United States

We study the impact of the increased availability of real-time information on the behavior of strategic agents and the implications of this phenomenon for service efficiency using data from one of the leading e-hailing taxi platforms in South America.

093-2464 Believing in Analytics: Managers' Adherence to Price Recommendations from a DSS

Felipe Caro, Professor, UCLA Anderson School of Management, United States
Anna Saez De Tejada Cuenca, Student, UCLA Anderson School of Management, United States

We analyze the drivers of adherence to a DSS's price recommendations using data from a fast fashion retailer. We study two interventions aimed to increase adherence, as well as the cognitive biases driving adherence. Our results provide insights on how to design better DSSs to entice practitioners to use them.

093-0779 Mitigating the Negative Effects of Customer Anxiety through Access to Human Contact

Michelle Shell, Student, Harvard University, United States
Ryan Buell, Associate Professor, Harvard Business School, United States

Through a series of lab and field experiments, conducted in the high-anxiety domain of financial services, we document the negative effects of anxiety on customer performance and demonstrate how providing customers with access to human contact can improve customers' willingness to engage, elevate choice satisfaction, and engender trust in companies.

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Saturday, 04:00 PM - 05:30 PM, Columbia 10 Track: Product Innovation and Technology Management

Invited Session: Empirical and experimental research in NPD and innovation

Chair(s): Evgeny Kagan

093-0231 Search Under Constraints

Sezer Ulku, Associate Professor, Georgetown University, United States

Slack resources are required for innovation to explore the many unknowns. It is also suggested that “necessity is the mother of invention”, and that constraints result in superior innovation performance. Through a series of experiments, we examine how constraints influence search strategies and the performance achieved in problem solving tasks.

093-0857 Set Asides for Small Businesses in the Public Sector R&D Contracts

Dwaipayan Roy, Student, University of Minnesota, United States
Anant Mishra, Associate Professor, Carlson School of Management, United States
Kingshuk Sinha, Professor, University of Minnesota, United States

This paper investigates the performance outcomes of R&D contracts that have been awarded preferentially to small businesses by the US Federal Government. Specifically, we examine how the contract pricing type and contractor experience influences the relationship between the Set Asides status of a contract and its performance outcome.

093-0931 Platform Diversification in the Presence of Quality Uncertainty

Kyungmin (Brad) Lee, Student, Questrom School of Business, United States
Nitin Joglekar, Associate Professor, Questrom School of Business, United States

A platform can grow by diversifying products/services on its existing network. We set up a model for platform diversification with quality uncertainty, and posit increasing the quality threshold decreases market share, but increases cross-subsidies. We evaluate the finding in the context of UBER Eats service.

093-1039 Help or Hindrance? The Role of Familiarity in Collaborative Product Development

Karthik Ramachandran, Associate Professor, Georgia Institute of Technology, United States
Necati Tereyagoglu, Assistant Professor, Georgia Institute of Technology, United States
Murat Unal, Student, Cornell University, United States

We empirically study product development in the video game industry by coupling a granular database of development credits with sales data. We find that familiarity in the team is associated with a decrease in the product's performance and this is primarily driven by the negative effect of familiarity among designers.

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Saturday, 04:00 PM - 05:30 PM, Columbia 11 Track: Inventory Management

Contributed Session: Data-driven Inventory Management

Chair(s): Bhawna Priya

093-0387 Optimal Learning Algorithms for Stochastic Inventory Systems with Fixed Cost

Cong Shi, Assistant Professor, Department of Industrial Enginnering, United States
Hao Yuan, Student, Department of Industral Engineering, United States
Qi Luo, Student, University of Michigan, United States

We study the regret minimization in single-item inventory control problem with demand censoring. The ordering cost includes a fixed setup cost. We find a data-driven (s,S) inventory policy with a performance guarantee by combining zeroth-order optimization (bandit control) and first-order optimizatoin (stochastic gradient descent) techniques.

093-2163 Production Planning with Multiple Production Lines: Forward Algorithm and Insights on Volume Flexibility

Suresh Chand, Professor, Purdue University, United States
Sunantha Teyarachakul Prime, Associate Professor, California State University at Fresno, United States
Suresh Sethi, Professor, University of Texas Dallas, United States

We consider the cost-minimization production planning problem of a shop with multiple parallel production lines each with a limited daily capacity. The shop adjusts the number of lines it operates to meet the dynamic demands. This paper provides an efficient dynamic-programming algorithm and managerial insights on management of volume flexibility.

093-2065 Data-Driven Inventory Management: The Impact of Information Acquisition

Yugang Yu, Professor, University of Science and Technology of China, China
Yong-Pin Zhou, Professor, University of Washington, United States
Yifei Luo, Student, University of Science and Technology of China, China

This paper studies an innovative inventory and promotion policy that manufacturers may obtain advanced demand information of a perishable product from a mobile app with heterogeneous consumers. Using data, including online scanning demand and suppliers' order, we investigate the optimal policy depends on the cost of inventory and consumer segments.

093-2450 Limited clearance sale inventory model with fi□nancial constraint

Bhawna Priya, Post Doc/Researcher, Indian Institute of Management Lucknow, India
Indranil Biswas, Assistant Professor, Indian Institute of Management Lucknow, India

A dyadic supply chain with financially constrained retailer is analyzed. The retailer employs limited clearance sale strategy for leftover inventory. Retailer earns higher profit if market demand is less than optimal order quantity. Buyback and revenue sharing contracts enable the supplier to coordinate the supply chain under full information setting.

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Saturday, 04:00 PM - 05:30 PM, Columbia 12 Track: Service Operations

Contributed Session: Optimization in Service Systems

Chair(s): Debdatta Sinha Roy

093-0548 Study on Opening Models for Video Site: When Should a Firm Charge for Online Content?

Shengshuo Xu, Student, Ustc, China

A monopolistic video site provides two open models for viewers: payment and free. Video sites need to determine optimal price, advertising time, and free video definition. We find that when only a free model is open, video sites should provide high definition video to attract more viewers.

093-1567 Capacity Reservation of Nursing Homes in Elder-Care Management

Xiaobei Shen, Associate Professor, Univ Sci & Technol China, China
xiong caiyuan, Student, University of Science and Technology of China, China
Yugang Yu, Professor, University of Science and Technology of China, China

We consider a periodic review capacity allocation problem for the nursing homes that face general random demands. The objective is to minimize the service costs over a finite planning horizon by rationing capacity in each period. We derive the optimal allocation policy based on the decomposition of the value function.

093-2348 Operational Perils and Benefits of Free Trials in Large Scale Service Systems

Yasar Levent Kocaga, Associate Professor, Sy Syms School of Business, United States
Chihoon Lee, Associate Professor, Stevens Institute of Technology, United States

We consider the pricing and joint pricing and capacity sizing problem of a large scale service firm catering to price, delay sensitive customers, and that has the option of offering free trials. We provide approximately optimal solutions, which we then use to assess the effect of offering free trials.

093-0636 Data-Driven Optimization and Statistical Modeling to Improve Meter Reading for Utility Companies

Debdatta Sinha Roy, Student, University of Maryland, United States
Christof Defryn, Assistant Professor, Maastricht University, Netherlands
Bruce Golden, Professor, University of Maryland, United States
Edward Wasil, Professor, American University, United States

Utility companies collect usage data from meters on a regular basis using RFID. In practice, there is uncertainty while reading meters from the planned routes of the vehicles leading to missed reads. We use optimization and statistics to address the uncertainty and validate our results with simulations using real data.

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Saturday, 04:00 PM - 05:30 PM, Monroe Track: Purchasing and Supplier Management

Invited Session: Panel: CAPS Showcase 2

Chair(s): Thomas Choi

093-2415 CAPS Showcase 2

Thomas Choi, Professor, Arizona State University Tempe, United States
Thomas Kull, Associate Professor, Arizona State University Tempe, United States
David Peng, Associate Professor, University of Houston, United States
Wendy Tate, Professor, University of Tennessee, United States
Stephan Wagner, Professor, Swiss Federal Institute of Technology Zurich, Switzerland
Tobias Schoenherr, Professor, Michigan State University, United States

In this session, another group of researchers will present their recent projects, so the audience will get an overview of the type of leading-edge issues large Fortune-500 companies grapple with.

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Saturday, 04:00 PM - 05:30 PM, Lincoln East Track: Empirical Research in Operations Management

Invited Session: Workshop: Endogeneity in Operations Management

Chair(s): David Ding

093-2448 Endogeneity in Operations Management

David Ding, Assistant Professor, Rutgers Business School, United States
David Peng, Associate Professor, University of Houston, United States

There is still a gap for empirical researchers to understand how to address endogeneity rigorously. The workshop will get together several empirical researchers to share their experience and approaches for handling endogeneity.

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Saturday, 04:00 PM - 05:30 PM, Lincoln West Track: Empirical Research in Operations Management

Contributed Session: Project Management

Chair(s): yin jinmei

093-0573 A Framework of Achieving Agility Within Construction Project Management

Roula Michaelides, Reader, Manchester Metropolitan University, United Kingdom
Zenon Michaelides, Reader, Manchester Metropolitan University, United Kingdom
David Bryde, Professor, ????, United Kingdom
Martin Rost, Associate Professor, University of Stuttgart, Germany

Within organizations, agility denotes the ability to anticipate, respond, adjust to disruptions/changes. Within construction this ability manifests in the capacity to develop capabilities across entire construction-supply-networks prior to event-responding. This study adopts a phenomenological case-approach presenting an agility integrating framework for construction projects focusing on organizational systems and practices.

093-1928 Operational Lifecycles of Manufacturing Firms

Nihar Kumthekar, Student, Georgia Southern University, United States
Alan Mackelprang, Associate Professor, Georgia Southern University, United States

This study investigates the presence of operational performance patterns (e.g. life-cycles) in manufacturing firms. Utilizing a secondary data set, we find evidence that market dominant and bankrupt firms exhibit differing operational life-cycle patterns.

093-2370 Are Unannounced Inspections Really Unannounced? An Empirical Examination

Sehwon Kang, Student, University of Minnesota, United States

In this study, we investigate whether unannounced inspections could be accurately estimated using predictive analytics and how the predictability influences inspection outcome.

093-1094 Antecedents of Motor Insurance Claims: Empirical Evidence from Indian Insurance Industry

Milind Padalkar, Professor, BENNETT UNIVERSITY, India

Motor insurance business generally faces customer churn, high agent commissions, high claim ratios, and low profitability. Using multiple regression analysis of data of Indian firms, I show superior customer service and agent quality as it correlates to building good risk portfolio characterized by lower claim ratios and higher profitability.

093-1639 Does It Pay to Align a Firm's Competitive Strategy with its Industry IT Strategic Role?

yin jinmei, Student, university of science and technology of china, China
shaobo wei, Associate Professor, university of science and technology of china, China

Based on the data of Chinese publicly listed firms during 2009-2015, this study theorizes and empirically tests how the firm's competitive strategy aligns with its industry IT strategic role to improve firm performance. The empirical results present a more nuanced understanding between firm competitive strategy and industry IT strategic role.

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Saturday, 04:00 PM - 05:30 PM, Jefferson East Track: Panels & Meetings

Contributed Session: Doctoral Consortium 3

Chair(s): Ozge Sahin

093-2432 Doctoral Consortium 3

Ozge Sahin, Associate Professor, Johns Hopkins University, United States

This session is by invitation only for those doctoral students who have registered. The POMS Doctoral Consortium is to help doctoral students maximize their chances of having a successful academic career in our globally competitive environment.

Saturday, 04:00 PM - 05:30 PM

337 Saturday, 04:00 PM - 05:30 PM, Jefferson West — Track: Panels & Meetings

Invited Session: Meet the POM Editors

Chair(s): Subodha Kumar

093-2427 Meet the POM Journal Editors

Subodha Kumar, Professor, Temple University, United States

The Production and Operations Management Journal's departmental editors and the editor-in-chief will be here to meet conference participants in order to discuss any publication issues. All are welcome.

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338 Saturday, 04:00 PM - 05:30 PM, Georgetown East — Track: Supply Chain Risk Management

Invited Session: Disruption and Uncertainty

Chair(s): Yanzhi Li

093-1203 Robust Salesforce Contracts with Inventory Considerations

Xiangyin Kong, Student, City University of Hong Kong, China

Yimin Yu, Associate Professor, City University of Hong Kong, Hong Kong

We consider the salesforce compensation in the presence of inventory consideration and model uncertainty. Under our setting, the sales are limited by the inventory level and the lost sales are unobservable. The firm has ambiguity over the underlying distribution of the effort-contingent demand.

093-1224 Trade Credit in a Dual-Channel Supply Chain

Jiayan Xu, Assistant Professor, Sun Yat-Sen University, China

We build a dual-channel supply chain to investigate the impacts of trade credit on the vertical and horizontal supply chain interactions. When two retailers have unbalanced financial statuses, we find that the supplier may bail-out the financially distressed retailer and that the predation between retailers exhibits a bidirectional pattern.

093-1929 Buyback and Risk Sharing Contracts to Mitigate the Supply and Demand Disruption Risk

Rita Difrancesco, Assistant Professor, Eada Business School , Spain

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

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

This paper investigates the dual sourcing problem under demand and supply uncertainty. We propose an analytical model based on risk sharing contract with primary supplier and buyback contract with backup supplier to mitigate the risk of demand uncertainty, supply disruption and random yield in a two echelon supply chain.

093-1256 Policy Uncertainty Disrupted Supply Chains

Jing Wu, Assistant Professor, City University of Hong Kong, Hong Kong

Kekun Wu, Assistant Professor, Zhongnan University of Economics and Law, China

Yanzhi Li, Associate Professor, City University of Hong Kong, Hong Kong

Using a sample of U.S. firms and their international suppliers and customers, we study the impact of American and foreign economic policy uncertainty on the choice for firms to adjust their supply chain. We find that higher domestic economic policy uncertainty leads firms to shift production abroad (suppliers).

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339 Saturday, 04:00 PM - 05:30 PM, Georgetown West — Track: Teaching/Pedagogy in POM

Invited Session: New Technology in Effective Learning

Chair(s): Soheil Sibdari

093-1101 Teaching Text Analytics to MBAs: A New Case Study and Excel Tool

C. Daniel Guetta, Lecturer, Columbia University, United States

Demand for classes focusing on data analytics and data science is booming. We present a case study on text analytics in law together with a new Excel tool that can be used to teach these subjects at an advanced level to audiences with a broad range of technical backgrounds.

093-1767 Two Easily Implemented Active Learning Exercises in OM

Brad Meyer, Associate Professor, Drake University, United States

Two exercises will be presented: a group discussion case in management of technology and an exercise to practice visualization skills to find the root cause of defects. The second uses data randomly generated for each student to make it near to impossible to copy from another student.

093-0453 AWOL: The Analytics Concepts Missing in our Courses

Srini Krishnamoorthy, Lecturer, Simon Fraser University, Canada

The talk will focus on incorporating the analytics concepts that we tend to exclude from our courses. We teach the normal distribution, but ignore the power law distribution; we teach linear regression, but ignore quantile regression. Often, these neglected concepts are more useful for real world managers.

093-1240 Methods and Tools in Operations Management – Experience from Inverted-Classroom-Teaching

Stefan Treitl, Senior Lecturer, ????, Austria

Lena Silbermayr, Assistant Professor, Vienna Univ of Econ & Business Admin, Austria

Martin Waitz, Post Doc/Researcher, University of Economics and Business, Austria

Our application-focused undergraduate class “Methods and Tools in Operations Management” is designed in a way that allows the comparison of traditional lectures and Inverted-Classrooms, where students prepare the content themselves before the actual contact sessions. We compare the students’ performance in the different didactic settings and present the results.

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Saturday, 04:00 PM - 05:30 PM, Cabinet Track: Sustainable Operations

Invited Session: Emerging Topics in Sustainable Operations

Chair(s): Shouqiang Wang

093-0592 Supplier Centrality and Auditing Priority in Socially-Responsible Supply Chains

Jiayu Chen, Student, University of Texas Dallas, United States
Anyan Qi, Assistant Professor, University of Texas Dallas, United States
Milind Dawande, Professor, University of Texas Dallas, United States

Most supply networks are characterized by ?rms that source from multiple suppliers and suppliers that serve multiple ?rms, thus resulting in suppliers who di?er in their degree centrality, i.e., the number of ?rms they supply to. We explore how supplier centrality affects socially-supply chains and offer novel and useful insights.

093-1206 Values of Traceability in Supply Chains

Yao Cui, Assistant Professor, Cornell University, United States
Ming Hu, Professor, University of Toronto, Canada
Jingchen Liu, Student, Peking University, China

We consider supply chains where the buyer cannot identify which supplier is at fault when quality defect occurs (e.g., agri-food). We study the impact of Blockchain-enabled traceability on supply chain quality contracts, in both parallel supply chains and serial supply chains, and derive insights into the value of traceability.

093-2251 Predictive Analytics for Ensuring Facilities' Environmental Compliance

Yasaman Mohammadshahi, Student, Georgia Institute of Technology, United States
Beril Toktay, Professor, Georgia Institute of Technology, United States
Pinar Keskinocak, Professor, Georgia Institute of Technology, United States

In this work, we utilize statistical and machine learning methods to help the Environmental Protection Agency with facility selection for emission inspections.

093-1480 Does Societal Orientation Help Innovations? An Empirical Investigation of US Manufacturing Firms

Sandeep Jagani, Assistant Professor, Illinois State University, United States
Paul Hong, Professor, University of Toledo, United States
Anand Kunnathur, Professor, University of Toledo, United States

Societal orientation forms the backbone of sustainability orientation in firms. This study indicates that societal orientation plays a significant moderating role on the relationship between sustainable product design, byproduct design, and innovations. The statistical inference is drawn from a panel survey of 207 US manufacturing firms across several industries.

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Saturday, 04:00 PM - 05:30 PM, Intl Ballroom East Track: Supply Chain Analytics

Invited Session: Data-Driven Methods and Applications

Chair(s): Yini Gao

093-0996 Thompson Sampling for Online Personalized Assortment Optimization Problems with Multinomial Logit Choice Models

Wang Chi Cheung, Assistant Professor, Department of ISEM, Singapore
David Simchi-Levi, Professor, Massachusetts Institute of Technology, United States

We study an online assortment optimization problem where a seller aims to maximize the total revenue, despite the uncertainty and the heterogeneity in the customers' personalized Multinomial Logit choice models. We propose a Thompson sampling policy, which is probably near-optimal and performs well empirically.

093-1232 Joint Pricing and Production: A Fusion of Machine Learning and Robust Optimization

Georgia Perakis, Professor, Massachusetts Institute of Technology, United States
Melvyn Sim, Professor, National University of Singapore, Singapore
Qinshen Tang, Student, National University of Singapore, Singapore
Peng Xiong, Lecturer, National University of Singapore, Singapore

We integrate machine learning with distributionally robust optimization to address a two-period problem for the joint pricing and production of multiple items. We investigate the problem by proposing a K-means adaptive markdown policy and an affine recourse approximation; the latter allows us to reformulate the problem into an MILP.

093-0909 A Statistical Study of the Factors Affecting Variable Shipment Costs

Carl Zunker, Student, Air Force Institute of Technology, United States
Kalyn Howard, Student, Air Force Institute of Technology, United States
Seong-Jong Joo, Associate Professor, Air Force Institute of Technology, United States

Trucking transportation costs consist of pre-negotiated linehaul base costs plus variable costs. This is an exploratory observational study of full truckload linehaul shipments using simple linear regression. We develop a model for more accurately predicting the variable costs, thus providing industry with precise total shipment cost information.

093-2349 EVs Grid Dispatching Integrated with V2G

ying yin, Student, Beijing Institute of Technology, China
Zihao Jiao, Student, Beijing Institute of Technology, China
Lun Ran, Professor, Beijing Institute of Technology, China

We propose to integrate V2G into the new energy vehicle grid, and propose a multi-objective planning model that considers the user's utility. It is proved by experiments that this kind of operation model has achieved the goals we proposed earlier.