

# Sessions for Wednesday, May 24

Wednesday, 08:00 AM - 09:30 AM

## Invited Session

298	Wednesday, 08:00 AM - 09:30 AM, Celebration 1	Track: Agriculture and Food Supply Chains
	Invited Session: Food Quality, Distribution, and Policy	
	Chair(s): Xiao Tan	

115-1043 Price Subsidies with or without Physical Procurement: Impact on Quality, Profits and Welfare

Aysajan Eziz, Assistant Professor, Ivey Business School, Western University, Canada  
Omkar Palsule-Desai, Associate Professor, Indian Institute of Management Indore, India  
Srinagesh Gavirneni, Professor, Cornell University, United States

Using a multi-stage incomplete information-based game-theoretic model, we comprehensively characterize Indian farmers' strategic production and selling decisions. We demonstrate that the government price support with multiple sales channels created by physically procuring the crop improves producer surplus when the farmers' landholdings are highly disparate, and the quality-based competition is lower.

115-1059 Spoilage Testing in the Fresh Produce Supply Chain

Baolong Liu, Assistant Professor, ShanghaiTech University, China  
Yanlu Zhao, Assistant Professor, Durham University, United Kingdom

We investigate spoilage testing in the fresh produce supply chain, aiming to control spoilage and reduce food waste. Through Bayesian modeling and stochastic optimization, surprisingly, we find such tests may even lead to more wastes in the supply chain. Hence, we design effective coordination mechanisms for better supply chain performances.

115-1068 Pantry Direct: a transformative supply chain for reducing food insecurity

John Lowrey, Assistant Professor, Northeastern University, United States  
Kenneth Boyer, Professor, Ohio State University, United States

We launch a direct-to-pantry retail donation program and find that 2/5 retail stores increased donations and another 2/5 stores decreased food waste. Decentralized food recovery also help address cross-sector collaboration challenges.

115-1311 Optimal Market Integration Decisions by Policy Makers: Modeling and Analysis of Agriculture Market Data

Shivam Gupta, Assistant Professor, University of Nebraska Lincoln, United States  
Saurabh Bansal, Associate Professor, Penn State University University Park, United States

We consider the spectrum of all possible integration policies spanning from full isolation to complete integration, and characterize the socially-optimal market integration, under general demands. Using data from the commercial seed market in EU, we show that socially-optimal integration provides a further improvement in the social surplus by 2.8%.

## Invited Session

299	Wednesday, 08:00 AM - 09:30 AM, Celebration 2	Track: Energy and Natural Resource Management
	Invited Session: Renewable Energy Adoption and Operations	
	Chair(s): Emre Nadar	

115-0445 Material Procurement and Circularity for Solar Panels

Nilsu Uzunlar, Student, Carnegie Mellon University, United States  
Alan Scheller-Wolf, Professor, Carnegie Mellon University, United States  
Siddharth Prakash Singh, Lecturer, UCL School of Management, United Kingdom

Solar energy adoption is estimated to increase rapidly considering technological enhancements and policy incentives. Unfortunately, this adoption faces two hurdles: lack of a circular outlook and the potential scarcity of crucial materials for manufacturing. We explore how policy initiatives and investments may be able to ameliorate both of these problems.

115-0784 Design of Efficient Feed-in Tariff and Tax Rebate Policies for Rooftop Solar Adoption

Saman TeymoorianMotlagh, Student, University of Calgary, Canada  
Serasu Duran, Assistant Professor, University of Calgary, Canada  
Osman Alp, Associate Professor, University of Calgary, Canada

Governments incentivize rooftop solar investments through feed-in tariff policies and tax rebates. Such policies put stress on the electricity distribution system and utility profits, increasing the bills of non-solar households. We identify the conditions for efficient feed-in tariff policies and optimal rebate levels that will make all stakeholders not worse-off.

115-0947 Optimal Hour-Ahead Commitment and Storage Decisions of Wind Power Producers

Emre Nadar, Assistant Professor, Bilkent University, Turkey  
Ece Cigdem Karakoyun, Student, Bilkent University, Turkey  
Harun Avci, Student, Northwestern University, United States  
Woonghee Huh, Professor, Sauder School of Business, UBC, Canada  
Ayse Selin Kocaman, Assistant Professor, Bilkent University, Turkey

## Wednesday, 08:00 AM - 09:30 AM

We study the energy commitment, generation and storage problem for a wind farm paired with a battery. We model this problem as a Markov decision process and characterize the optimal policy structure. We implement our structural results into a heuristic solution method that yields near-optimal solutions within a few minutes.

115-2038 Power Purchase Agreements with Renewable Energy Producers

Zuguang Gao, Student, University of Chicago, United States

Nur Sunar, Associate Professor, Kenan-Flagler Business School, United States

John Birge, Professor, University of Chicago, United States

We consider a firm that aims to sign a power purchase agreement (PPA) with a renewable energy producer. Using a stochastic control framework, we identify the optimal PPA design for the firm. Our analysis generates various valuable insights for both managers and policy makers.

### Contributed Session

300	Wednesday, 08:00 AM - 09:30 AM, Celebration 3	Track: Healthcare Operations Management
	Contributed Session: <b>Lean Operations in Healthcare</b>	
	Chair(s): Ahmad Ashkanani	

115-1342 Success Factors for Kaizen Events in Hospitals

Kimberly Harry, Student, Virginia Tech, United States

Wiljeana Glover, Associate Professor, Babson College, United States

Kaizen events (KEs) provide valuable opportunities to address healthcare challenges. This study conducts a systematic literature review to identify the critical success factors (CSFs) for KEs in hospitals. We found across 48 papers that most CSFs occur in the KE Team Design, Organization, and KE Process success factor categories.

115-1530 Maximizing the Impact of Lean: The Importance of Soft and Hard Practices

Ahmad Ashkanani, Assistant Professor, Kuwait University, Kuwait

Using longitudinal data and mixed methods, we examine and identify the challenges and success factors associated with implementing soft and hard lean practices in a large US healthcare system undergoing a lean transformation process.

115-1675 Lean Healthcare: Preparation and Implementation Capabilities

David Barrett, Assistant Professor, Ivey Business School, Western University, Canada

Fernando Naranjo, Assistant Professor, Niagara University, United States

Larry Menor, Associate Professor, Ivey Business School, Western University, Canada

We present the results obtained from a multiple case study that describes what constitutes lean preparation capabilities and lean implementation capabilities enabling lean deployment in the healthcare organization context. Our findings are summarized in a theoretical framework that illustrates the structure and association of these linkages.

115-2087 The role of lean in building crisis response capabilities

Altricia Dawson, Assistant Professor, University of Nottingham, United Kingdom

Nicola Burgess, Associate Professor, University of Warwick, United Kingdom

Using insights from the dynamic capabilities and continuous improvement perspectives we conduct a multiple case study of five British hospitals to explore how lean adapts to respond to crisis. We find that a socio-technical implementation of lean is key to creating the dynamic process improvement capability needed during crisis.

### Invited Session

301	Wednesday, 08:00 AM - 09:30 AM, Celebration 4	Track: Healthcare Operations Management
	Invited Session: <b>Healthcare Operations and Information Technology</b>	
	Chair(s): Sidhartha Das	

115-0217 Addressing the Challenges with Integration and Interoperability of Healthcare Management Data

Vijay Agrawal, Professor, University of Nebraska Kearney, United States

Vipin Agrawal, Professor, University of Texas at San Antonio, United States

Poonam Khanna, Associate Professor, University of Texas at San Antonio, United States

Sherri Harms, Professor, University of Nebraska at Kearney, United States

Aravind Menon, Epidemiologist, Two Rivers Public health department, United States

The complexities in collecting, analyzing, and interpreting data increase manifold when dealing with integration and interoperability, particularly in the decentralized health care systems in the United States. We focus on evolution of dealing with these challenges in the United States and other such regions as Europe and Australia.

115-0218 Alternative Solutions to Address Integration and Interoperability of Healthcare Management Data.

Vijay Agrawal, Professor, University of Nebraska Kearney, United States

Vipin Agrawal, Professor, University of Texas at San Antonio, United States

Poonam Khanna, Associate Professor, University of Texas at San Antonio, United States

Sherri Harms, Professor, University of Nebraska at Kearney, United States

Aravind Menon, Epidemiologist, Two Rivers Public health department, United States

## Wednesday, 08:00 AM - 09:30 AM

Recent attempts to integrate electronic patient records have met with limited success. We assess the degree of complexity of healthcare management systems, examine existing efforts to improve them, and propose alternative cost-effective solutions. We evaluate alternatives in addressing these challenges and enhancing the quality of patient care.

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### 115-1074 Medical Capabilities, Hospital Workforce, HIT and Hospital Performance

Sidhartha Das, Professor, George Mason University, United States  
Amitava Dutta, Professor, George Mason University, United States  
Nirup Menon, Professor, George Mason University, United States

This study examines the impact of medical capabilities and healthcare information technologies (HIT) on hospital performance. It categorizes medical capabilities into diagnostic and therapeutic types, and using panel data, studies the direct and interaction effects of the two medical capabilities types and hospital workforce with HIT, on hospital performance measures.

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### 115-1630 Proposing A Circular Information Model for Ontario's Health System

Hamid Noori, Professor, Wilfrid Laurier University, Canada  
Jocelyne Diamonon, Professor, Wilfrid Laurier University, Canada  
christopher both, Professor, Wilfrid Laurier University, Canada

The current landscape of health data sharing and organization in Ontario, Canada, can be classified as a pipeline model characterized by its lack of visibility or in other words, lack of interoperability, access, privacy, and efficiency. We investigate how the current health system can be shifted to a circular model.

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## Invited Session

<b>302</b>	Wednesday, 08:00 AM - 09:30 AM, Celebration 5	Track: Healthcare Analytics
	Invited Session: <b>Deploying Health Technology</b>	
	Chair(s): David Rea      Eric Xu	

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### 115-0990 Nurse Staffing During a Pandemic: Prediction and Mitigation of In-Hospital Infections

Buyun Li, Student, Indiana University, United States  
Jonathan Helm, Associate Professor, Kelley School of Business, United States  
Pengyi Shi, Associate Professor, Purdue University, United States  
Kurt Bretthauer, Professor, Indiana University, United States

We offer an estimation method to a dynamic disease transmission model to model and predict the in-hospital transmission of the disease and the infection of the healthcare workers. Also, we offer analysis on mitigation methods via staffing to reduce infection and improve care quality.

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### 115-1381 E-Access versus Physical Access: An Examination of Telehealth

Eric Xu, Assistant Professor, Mississippi State University, United States  
Kevin Linderman, Professor, Penn State University, United States

While telemedicine has existed for half a century, only recent telecommunication advancements have increased the pace of adoption amongst patients and practitioners. Therefore, we examine the impact of broadband and physical access on telemedicine uptake. Using a unique dataset of insurance claims, we examine asynchronous and synchronous telehealth visits.

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### 115-1847 Smartphone Use, Social Support, and Sleep Health

Idris Adjerid, Assistant Professor, Virginia Polytechnic Institute And State University, United States  
Shaokang Yang, Student, Virginia Polytechnic Institute And State University, United States  
Jiayi Liu, Assistant Professor, Virginia Polytechnic Institute And State University, United States

The paper aims to investigate the impact of the pre-sleep smartphone use on users' sleep health. Moreover, we examine the heterogeneous impact of pre-sleep mobile communication activities on one's sleep health, with a particular focus on the social closeness and social relationship between the smartphone user and the contacts.

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## Invited Session

<b>303</b>	Wednesday, 08:00 AM - 09:30 AM, Celebration 6	Track: Healthcare Analytics
	Invited Session: <b>Health IT and Analytics</b>	
	Chair(s): Tan (Suparerk) Lekwijit	

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### 115-0094 The Value of Analytics Partnerships for Biopharmaceuticals

Jiatao Ding, Student, INSEAD, Singapore  
Niyazi Taneri, Associate Professor, University of Cambridge, United Kingdom  
Michael Freeman, Assistant Professor, INSEAD, Singapore

Through analytics partnerships, biopharmaceutical firms aim to gain complementary capabilities and streamline operations. In an industry with notoriously low success rates, improvements on these fronts translate to more products with longer periods of on-patent sales. We study shareholder value implications of such partnerships and when they add the most value.

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### 115-0196 Is Telemedicine Here to Stay? Equilibrium Analysis of an Outpatient Care Queueing Game

Xiaole (Alyssa) Liu, Student, New York University, United States  
Mor Armony, Professor, New York University Stern School of Business, United States

## Wednesday, 08:00 AM - 09:30 AM

Empirical studies observed that telemedicine could increase demand for in-person visits and overcrowd the clinic. We develop a queueing game model to assess the impact of telemedicine in equilibrium, which allows us to characterize the optimal resource allocation for outpatient clinics and the conditions under which introducing telemedicine is beneficial.

115-0606 MDscan: An Explainable Artificial Intelligence Algorithm for Mental Health Screening

Salih Tutun, Lecturer, Washington University in St Louis, United States  
Ali Tosyali, Assistant Professor, Rochester Institute of Technology, United States  
Kazim Topuz, Assistant Professor, University of Tulsa, United States  
Anol Bhattacharjee, Professor, University of South Florida, United States

This paper presents an explainable artificial intelligence algorithm called MDscan for screening patients for ten mental disorders based on their responses to the SCL-90-R clinical questionnaire. MDscan converts patients' SCL-90-R responses to a full-color explainable image to diagnosis, classify, and monitor mental health statuses of patients.

115-1025 Waiting Online versus In-Person in Outpatient Clinics: An Empirical Study on Visit Incompletion

Jimmy Qin, Student, Columbia University, United States  
Carri Chan, Professor, Columbia University, United States  
Jing Dong, Associate Professor, Columbia University, United States

Utilizing data from two large outpatient clinics, we show that intra-day delay increases telemedicine service incompletion rate but does not impact in-person service incompletion. Our counterfactual analysis indicates that not correctly differentiating the types of incompletions due to intra-day delays from no-show can lead to highly suboptimal patient sequencing decisions.

### Invited Session

304	Wednesday, 08:00 AM - 09:30 AM, Celebration 7	Track: Sustainable Operations Management
	Invited Session: <b>Studies in Environmental Sustainability</b>	
	Chair(s): Suvrat Dhanorkar Rick Hardcopf	

115-0058 Green Product-Service Innovation, Patents, and Nationals Sustainable Development Goals

Marco Opazo-Basaez, Associate Professor, University of Deusto, Spain  
Oscar Bustinza, Professor, University of Granada, Spain  
Luis Molina-Fernandez, Professor, University of Granada, Spain

This article draws on hybrid manufacturing, patents, and nationals' achievement related to the United Nations Sustainable Development Goals (SDGs). We focus specifically on green hybrid organizations, a particular kind of firms that entwines digital capabilities, product-service innovation (servitization), and environmentally focused operational initiatives in convergence with their performance objectives.

115-0503 Sustainability Orientation, Sustainability Implementation and Brand Image in Service firms

Sandeep Jagani, Assistant Professor, Illinois State University, United States  
Vafa Saboori-Deilami, Associate Professor, Dominican University of California, United States

This paper investigates the direct and indirect effects of sustainability orientation (i.e., the firm's strategic intent toward sustainability) and sustainability implementation (i.e., translating the strategic intent into actionable practices) in the service sector on customers' perceptions of the brand image. The findings are based on primary and secondary data sources.

115-0853 Complements or substitutes? Social scrutiny, supply chain social strategies and firms' environmental performance

Xiaojin Liu, Assistant Professor, Virginia Commonwealth University, United States  
Jeff Shockley, Associate Professor, Virginia Commonwealth University, United States  
Jeffery Smith, Professor, Virginia Commonwealth University, United States  
Jayanth Jayaram, Professor, University of Oklahoma, United States

There is an increasing need for global firms to improve and maintain socially and environmental responsible operations within organizations and in supply chains. In this study, we empirically investigate how a firm's supply chain social strategies interacts with the external social scrutiny to affect the firms' environmental performance.

115-1208 Optimizing Curbside Recycling Behaviors through use of Green Nudges and AI Generated Feedback

Erin McKie, Assistant Professor, Ohio State University, United States  
Jane Iversen, Student, Ohio State University, United States  
Aravind Chandrasekaran, Professor, Ohio State University, United States

With this study, we aim to investigate how two forms of recycling educational mechanisms ("pure nudges and moral nudges") may impact households' recycling performance. We will also examine how the effectiveness of AI-Generated Feedback compares with traditional educational mailers.

### Invited Session

305	Wednesday, 08:00 AM - 09:30 AM, Celebration 8	Track: Sustainable Operations Management
	Invited Session: <b>Operations at the Base of the Pyramid</b>	
	Chair(s): Chengcheng Zhai	

115-1180 Keep Water Flowing: The Hidden Crisis of Rural Water Management in Sub-Saharan Africa

Chengcheng Zhai, Student, Kelley School of Business, United States

## Wednesday, 08:00 AM - 09:30 AM

Rodney Parker, Associate Professor, Indiana University, United States

Kurt Bretthauer, Professor, Indiana University, United States

Jorge Mejia, Associate Professor, Indiana University, United States

Alfonso Pedraza, Professor, Indiana University, United States

It is estimated that one in four handpumps in rural SSA are broken. In this paper, we examine different water maintenance programs and develop a stochastic dynamic programming model to help NGOs improve their water points functionality.

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### 115-1353 Leapfrogging for Last-mile Delivery in Health Care

Harriet Jeon, Student, Wharton School, University of Pennsylvania, United States

We examine whether and the extent to which a technological innovation--delivery drones--leapfrogs a traditional infrastructure investment--specifically, paving roads. Using data from Rwandan public hospitals, we compare the impact of adopting drone delivery for blood transport on the inventory management of blood products and on health outcomes vis-à-vis paving roads.

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### 115-1810 Rent-to-Own Contracts in Developing Economies

Jose Guajardo, Assistant Professor, University of California Berkeley, United States

Elaheh Rashidinejad, Student, Rotman School of Management, Canada

Gonzalo Romero, Assistant Professor, University of Toronto, Canada

Hosain Zaman, Post Doc/Researcher, University of Toronto, Canada

We study consumer's payment behaviour under Rent-to-Own business models in developing economies where income uncertainty and hassle costs exists. We use a dynamic programming model to examine different contract designs that firms selling off-grid energy products offer to their customers to minimize expected time to ownership and improve social welfare.

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### 115-2070 Application mistakes and information frictions in college admissions

Ignacio Rios, Assistant Professor, UT Dallas, United States

Tomas Larroucau, Assistant Professor, Arizona State University, United States

Anais Fabre, Student, Toulouse School of Economics, France

Christopher Neilson, Associate Professor, Yale University, United States

We study application mistakes in college admissions. To alleviate these, we designed and implemented a field experiment providing information to help students to improve their applications, and we find that students that are less likely to get admitted are the ones who benefit the most.

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## Invited Session

<b>306</b>	Wednesday, 08:00 AM - 09:30 AM, Celebration 9	Track: Supply Chain Management
	Invited Session: Recent Issues in SCM	
	Chair(s): Yulan Wang Kai Pan	

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### 115-0040 Robust Sourcing under Multi-level Supply Risks: Analysis of Random Yield and Capacity

Kai Pan, Associate Professor, The Hong Kong Polytechnic University, Hong Kong, China

Ming Zhao, Assistant Professor, University of Delaware, United States

Nickolas Freeman, Associate Professor, University of Alabama Tuscaloosa, United States

We consider the optimal sourcing problem when the available suppliers are subject to ambiguously correlated supply risks. We propose a distributionally robust model that accommodates multiple levels of supply disruption and can utilize data-driven estimates of the underlying correlation. Analytical and numerical results are provided.

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### 115-0130 Improving Health Outcomes with Less Cost? Provision of Mobile Clinic in Developing Economies

Fang Liu, Associate Professor, University of Chinese Academy of Sciences, China

Pengfei Guo, Professor, Hong Kong Polytechnic Univ, Hong Kong, China

Yulan Wang, Professor, Hong Kong Polytechnic Univ, Hong Kong, China

Yuejuan Xi, Post Doc/Researcher, University of Chinese Academy of Sciences, China

Consider a public healthcare system consisting of a hospital, a mobile clinic (MC), and a population of potential patients. We stand on the government's perspective to investigate how the mobile clinic can reduce the system's healthcare spending while improving the population's health outcomes.

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### 115-0679 Dual Sourcing under Random Yields and Quality Uncertainty: Supplier Diversification, Capacitated Competition, and Fairness Concerns

Yanli Tang, Lecturer, Sun Yat-Sen University, China

Xin Wang, Assistant Professor, Hong Kong University of Science & Tech, Hong Kong, China

Yulan Wang, Professor, Hong Kong Polytechnic Univ, Hong Kong, China

Dual sourcing is used to reduce supply risks, induce supplier competition, and gain large capacity. However, sourcing components from two suppliers can cause product quality heterogeneity and consumers' fairness concerns. We characterize the impacts of these factors and analyze how they jointly affect equilibrium outcomes of a supply chain.

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### 115-1788 Managing Panic Buying with Bayesian Persuasion

Tianqi Song, Student, City University of Hong Kong, Hong Kong, China

Biyang Shou, Professor, City University of Hong Kong, Hong Kong, China

Pengfei Guo, Professor, City University of Hong Kong, Hong Kong, China

## Wednesday, 08:00 AM - 09:30 AM

We study how a retailer with private information can send persuasive signals to influence the customers' panic buying behaviors under supply disruption risk. We apply the Bayesian persuasion framework and derive the optimal joint decisions of information design and inventory control.

### Invited Session

<b>307</b>	Wednesday, 08:00 AM - 09:30 AM, Celebration 10	Track: Supply Chain Management
	Invited Session: Reshaping operations management with data-driven techniques and emerging technologies	
	Chair(s): Xinjie Xing	

115-0278 Interoperability of data in the supply chain management

Daniel Luiz Nascimento, Professor, CERTI, Brazil

Flavio Magno, Project Manager, CERTI, Brazil

Alessandra Roeder, Project Manager, CERTI, Brazil

Diego Calvetti, Post Doc/Researcher, CERTI, Portugal

Guilherme Tortorella Tortorella, Associate Professor, University of Melbourne, Australia

This study proposes an architecture that automatizes the data exchange between, enhancing the interoperability across the supply chain. A case study in an oil company was conducted to illustrate the approach. Results suggest that the interoperability of data significantly improved the collaboration between customers and agents, mitigating redundancies and errors.

115-1360 Data Driven Mechanism Design and the Value of Data

Sikun Xu, Student, Washington University in St. Louis, United States

This paper considers the classical principal-agent problem under observational information, where only historical data is known to the principal. Furthermore, I propose the marginal value of data, defined as the expected increase in the objective value if one additional data sample is provided to the principal.

### Invited Session

<b>308</b>	Wednesday, 08:00 AM - 09:30 AM, Celebration 11	Track: Manufacturing Operations
	Invited Session: Socially responsible supply chain management	
	Chair(s): Yen-Ting Lin	

115-0109 Examining the Impact of Lenient and Harsh Audit Ratings on Supplier CSR

Tim Kraft, Associate Professor, 2801 Founders Dr, United States

Xiaojin Liu, Assistant Professor, Virginia Commonwealth University, United States

H. Sebastian Heese, Professor, North Carolina State University, United States

Robert Handfield, Professor, North Carolina State University, United States

Balaji Soundararajan, Student, North Carolina State, United States

We study how lenient and harsh audit ratings impact supplier CSR. Using audit data, we find lenient ratings reduce CSR severity. Testing moderators, we find that greater leniency helps to reduce CSR severity when a facility has low compliance ability and has been audited a small number of times.

115-1192 Implications of ride-hailing: Replacing or increasing personal and rental car ownership?

Jianing Li, Student, Purdue University, United States

Gokce Esenduran, Assistant Professor, Purdue University, United States

Constructing a detailed consumer utility model, we identify how ride-hailing platforms affect a dual-channel supply chain: when the unit manufacturing cost is sufficiently high, rental cars decrease while personal cars increase, leading to an increase in the overall ownership and, thus, the environmental impact.

115-2012 Electricity Pricing Rules for Residential Solar plus Storage: Economic and Environmental Impacts

Nur Sunar, Associate Professor, Kenan-Flagler Business School, United States

Jayashankar Swaminathan, Professor, University of North Carolina Chapel Hill, United States

Sinan Yorukoglu, Student, University of North Carolina at Chapel Hill, United States

We analyze the impacts of different pricing rules for residential solar plus storage customers on environment, utility profit and customer benefit. Using a large-scale dataset from California, we quantify these impacts. Our paper shows that prominent practical insights may fail depending on the adoption level of residential solar-plus-storage technology.

### Invited Session

<b>309</b>	Wednesday, 08:00 AM - 09:30 AM, Celebration 12	Track: Humanitarian Operations and Crisis Management
	Invited Session: Tutorial on Sustainable Humanitarian Operations	
	Chair(s): Iana Shaheen	

115-2137 Tutorial on Sustainable Humanitarian Operations

Iana Shaheen, Assistant Professor, University of Arkansas, United States

## Wednesday, 08:00 AM - 09:30 AM

In this session, an experienced and diverse list of panelists from academia will discuss the indicators and strategies that affect the sustainability of the humanitarian supply chains. We will explore how recent practices by research and practitioners in the area of sustainable disruption response can enhance humanitarian operations.

### Contributed Session

310	Wednesday, 08:00 AM - 09:30 AM, Celebration 13	Track: Humanitarian Operations and Crisis Management
	Contributed Session: <b>Evacuation, Warnings</b>	
	Chair(s): Irineu Brito Jr	

115-0806 Providing Access where Needed: Equity and Inclusion through Contraceptive Implant Removals by Mobile Outreach Teams

Lisanne van Rijn, Student, Erasmus University Rotterdam, Netherlands  
Harwin De Vries, Assistant Professor, Rotterdam School of Management, Netherlands  
Dominik Gutt, Assistant Professor, Rotterdam School of Management, Netherlands  
Luk Van Wassenhove, Professor, INSEAD, France

The demand for contraceptive implant removals is rising due to increasing uptake of the contraceptive implant. Mobile outreach teams can help achieve equitable and inclusive removal service provisioning. We perform a regression analysis to identify drivers of the need for outreach removal services and how operational decisions impact this need.

115-1454 Fleet sizing: Benchmarking opportunities in the humanitarian sector

Laura Turrini, Associate Professor, European Business School, Germany  
Nathan Kunz, Associate Professor, University of North Florida, United States  
Maria Besiou, Professor, Kuehne Logistics University, Germany  
Luk Van Wassenhove, Professor, INSEAD, France

Our paper provides fleet managers with useful insights for benchmarking their fleet. We 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 variables like infrastructure and income inequality.

115-1719 Do tweets and search trends relate to the distribution of ineffective medicines during the pandemic?

Roberto Fray Da Silva, Post Doc/Researcher, Universidade De Sao Paulo, Brazil  
Nathan Bruno, Student, Universidade Estadual Paulista Julio De Mesquita Filho - Unesp, Brazil  
Flaviane Saraiva, Student, University of Sao Paulo, Brazil  
Celso Hino, Post Doc/Researcher, São Paulo University, Brazil  
Irineu Brito Jr, Professor, Universidade Estadual Paulista Julio De Mesquita Filho - Unesp, Brazil

The COVID-19 pandemic and associated infodemic led to confusion and increased demand for various pharmaceutical products, such as hydroxychloroquine and ivermectin. This study correlates the web search and Twitter citation with the monthly sales of these products considering the period from March 2020 to December 2021 throughout Brazil.

### Invited Session

311	Wednesday, 08:00 AM - 09:30 AM, Celebration 14	Track: Service Operations
	Invited Session: <b>Service Operations in Healthcare</b>	
	Chair(s): Sanjeev Bordoloi	

115-0603 Performance tradeoff under VBP program structure

Xin Ding, Assistant Professor, Rutgers Business School, United States

In this study, I examine how hospitals trade off various performance metrics under the ongoing value-based purchasing program structure. The longitudinal study supports performance tradeoffs and also suggests that the tradeoff effect varies by different types of hospitals and is also subject to market conditions.

115-1115 Evaluation of Hospitals using DEA

Sanjeev Bordoloi, Associate Professor, University of St. Thomas, United States  
Mansoo Cho, Student, University of St. Thomas, United States

Improvement in operational efficiency is very important for any hospital. We obtained operational data from Centers for Medicare and Medicaid Services (CMS) for a list of hospitals from across the country and applied Data Envelopment Analysis (DEA) to evaluate performance. We also draw useful managerial implications to improve efficiency.

115-1599 Revisiting the Operating Room Utilization Problem in Surgical Services

Ravi Behara, Professor, Florida Atlantic University, United States  
Saharnaz Mehrani, Assistant Professor, Florida Atlantic University, United States

Operating room (OR) scheduling significantly impacts patient and healthcare-provider satisfaction and has clinical and financial effects on hospitals. This study investigates the application of data analytics and optimization to improving OR utilization while considering patients and providers criteria. We perform numerical experiments on real data from a large urban hospital.

115-1670 The impact of queue rank changes on the waiting time in the Emergency Department

Lu Wang, Assistant Professor, Ball State University, United States

## Wednesday, 08:00 AM - 09:30 AM

Suman Mallik, Associate Professor, University of Kansas, United States

Mazhar Arikan, Associate Professor, University of Kansas, United States

We empirically investigate the impacts of the change in patient queue rank on patient waiting time in the ED. We demonstrate that the additional arrivals of patients before the end of waiting time contribute to the queue rank changes, and they both affect the patient waiting time significantly.

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### Invited Session

312	Wednesday, 08:00 AM - 09:30 AM, Celebration 15	Track: Information Systems and Operations Management
	Invited Session: Ride Hailing Platforms	
	Chair(s): Masoumeh Shahsavari	

115-0658 Sustainability Of Ride-Hailing Platform: A Game-Theoretic Approach

Amir Zamani, Student, Temple University, United States

Subodha Kumar, Professor, Temple University, United States

In this study we analyze how the changes in the benefit that drivers obtain from the ride-hailing platform affect (i) participation in the network and (ii) the prices of each ride. We are using game theory to determine the best decision the platform can make about prices.

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115-1720 Quick Ride or Lower Fee? Price and Waiting-time Differentiation in Ride-Hailing Platforms

Masoumeh Shahsavari, Student, Temple University, United States

Emre Demirezen, Assistant Professor, University of Florida, United States

Subodha Kumar, Professor, Temple University, United States

Ride-hailing platforms allow consumers to choose between two prices associated with different levels of waiting time. In this paper, we concentrate on the impacts of this pricing strategy on the platform's profit and its competitive position in a monopoly and a duopoly environment with a game theory approach.

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115-1819 Give Uber and Lyft a Ride: Ride-Hailing to Mobility as a Service (MaaS) Platforms

Samayita Guha, Assistant Professor, Florida International University, United States

Emre Demirezen, Assistant Professor, University of Florida, United States

Subodha Kumar, Professor, Temple University, United States

Ride-hailing platforms like Uber and Lyft are engaging in additional services to become financially sustainable and transforming themselves into mobility as a service (MaaS) platforms. In this paper, we study the impact of additional services on the driver compensation and daily operations of MaaS platforms in a competitive setting.

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### Invited Session

313	Wednesday, 08:00 AM - 09:30 AM, Coral Spring 1	Track: Emerging Topics in Operations Management
	Invited Session: Emerging Topics in Empirical Operations	
	Chair(s): Robert Niewoehner	

115-0210 From Mobility to Traffic: How Patient Movement Preferences Altered Healthcare Visits during Covid-19

Robert Niewoehner, Assistant Professor, Kelley School of Business, United States

Bradley Staats, Professor, University of North Carolina Chapel Hill, United States

Though serious consequences follow delayed or omitted care, with the emergence of Covid-19 in March of 2020, traffic to many healthcare clinics fell dramatically overnight. Using aggregate measures of patient mobility, this study seeks to characterize factors which explain the drops in traffic and so enable better traffic prediction.

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115-0673 Does the Seller's Response Time Affect the Buyer's Concession? Evidence from eBay Bargaining

Guihua Wang, Assistant Professor, University of Texas Dallas, United States

Wen Zhang, Assistant Professor, Baylor University, United States

We empirically analyze the effect of the seller's response time on the buyer's concession in online marketplace bargaining. We find that a one-percent increase in the seller's response time increases the buyer's concession by 0.435%. We also find that the effect is heterogeneous across item categories and conditions.

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115-1238 The impacts of digital twin on supply chain resilience and robustness: A system lens view

Di Li, Senior Lecturer, University of Warwick, United Kingdom

Donato Masi, Reader, Aston Business School, United Kingdom

Chao Deng, Student, University of Warwick, United Kingdom

Rebecca Wilde, Senior Lecturer, University of Warwick, United Kingdom

As one post-pandemic effect, companies realized the essentials of supply chain resilience and robustness thus endeavour to improve them, which requires a view of system lens for achieving a fundamental upgrade. This paper will reveal the digital twin system in contributing to resilience and robustness, embedded roles of multi-digital capabilities

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115-2067 Optimizing Food Programs using Hybrid Data Sources: Models and Experimental Evidence from India

Alp Sungu, Student, London Business School, United Kingdom

Ali Aouad, Assistant Professor, London Business School, Great Britain

Kamalini Ramdas, Professor, London Business School, United Kingdom



## Wednesday, 08:00 AM - 09:30 AM

We study the design of in-kind food subsidy programs targeted at underserved communities. In a field experiment in India, we exogenously vary the subsidized food. Based on estimates of the take-up rates, we uncover a tradeoff between the nutrient richness of different staples and their attractiveness to customers.

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### Contributed Session

314	Wednesday, 08:00 AM - 09:30 AM, Coral Spring 2	Track: Global Supply Chain Management
	Contributed Session: <b>Meeting the challenges of cross-border supply chain</b>	
	Chair(s): Arvind Upadhyay	

115-0291 The "Out-of-China" Effect: Supply Chain Adaptation to Geopolitical Disruptions

Travis Kulpa, Student, University of Arkansas - Fayetteville, United States

We examine whether US imposed tariffs on Chinese products (HS 10-digit level) beginning in 2018 led to sourcing pattern changes for those products to nearshore countries or other Asian locations. We test product-level moderating hypotheses of sourcing interdependence and upstreamness. Fixed effects models are used to test the hypotheses.

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115-0534 Sustainable Supply chain Practices Across Multiple Countries.

Purushottam Meena, Associate Professor, College of Charleston, United States

Rita Difrancesco, Assistant Professor, Eada Business School, Spain

Gopal Kumar, Associate Professor, iim raipur, India

This paper studies supply chain sustainability implementation practices across different regions. Primary data is collected and analyzed using the structural equation modeling to compare the sustainability implementation status, benefits, and barriers across European and South American companies. The results show promising insights for academicians and practitioners.

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115-1928 Challenges and Opportunities in Cross-Border Supply Chain

Arvind Upadhyay, Professor, University of Stavanger, Norway

Farheen Naz, Student, University of Stavanger, Norway

Cross-Border supply chain is increasing globally due to the reduced logistics cost, tariffs, and trade barriers. However, there are significant collaboration challenges due to different rules, regulations and systems. Digitization and sustainable development goals are creating opportunities for more collaborations. This paper examines challenges and opportunities in cross-border supply chain.

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115-2071 Using Flipped Learning to Prepare Talent for the Global Supply Chain

William Swart, Professor, East Carolina University, United States

Kenneth MacLeod, Associate Professor, East Carolina University, United States

The unique characteristics of global supply chains are presented together with the required talents for professionals to successfully manage them. Flipped learning is presented as an ideal pedagogy for both formal and informal development of those talents.

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### Invited Session

315	Wednesday, 08:00 AM - 09:30 AM, Blue Spring 1	Track: Supply Chain Risk Management
	Invited Session: <b>Managing disruption risk in supply chain</b>	
	Chair(s): Florian Lucker	

115-0664 Sample Complexity of Policy Learning for Inventory Control with Censored Demand

Xiaoyu Fan, Student, New York University, United States

Boxiao (Beryl) Chen, Associate Professor, University of Illinois at Chicago, United States

Zhengyuan Zhou, Assistant Professor, New York University, United States

We study both single-period and infinite-horizon inventory models with unknown demand distribution and propose sampling-based approximation policies using censored demand data. We develop upper bounds for the number of samples required to guarantee the accuracy of our proposed policy, which is shown to match the existing lower bound.

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115-0678 Trade credit contracts under weather risk in supply chains

Piyal Sarkar, Assistant Professor, University of Wisconsin, Green Bay, United States

Wahab Ismail, Professor, Ryerson University, Canada

Liping Fang, Professor, Ryerson University, Canada

The study explores the coordination mechanism of trade credits in supply chain with weather-related uncertainties. It contributes to the understanding of trade credit contracts and their implementations to withstand weather and credit risks in supply chains. Industries can use these contracts to coordinate supply chains under weather risk.

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115-1097 The Lost Decade for U.S. Manufacturing Jobs: A Story of Cost and Risk

Nikolay Osadchiiy, Associate Professor, Emory University, United States

Sridhar Seshadri, Professor, University of Illinois Urbana-Champaign, United States

Shi Qiu, Student, University of Illinois at Urbana Champaign, United States

We propose two perspectives on U.S. manufacturing job losses to countries in Asia in 1990-2011: production cost arbitrage and the management of supply-demand mismatch. Combined with model prediction, we observe strong support for the cost arbitrage motive in 1990-2000 and the risk management motive after China's entry into the WTO.

## Wednesday, 08:00 AM - 09:30 AM

115-1513 Using anticipatory orders to manage disruption risk over a short product life cycle

Florian Lucker, Assistant Professor, Bayes Business School, United Kingdom

Sunil Chopra, Professor, Kellogg School of Management, United States

We study the impact of supply disruptions over short product life cycles where future demand depends on current sales. We introduce the concept of anticipatory orders: orders that are moved from a future period to an earlier period. We show that despite incurring additional holding cost, anticipatory orders are valuable.

115-1937 Supply chain risk and resolution: An empirical study of stock market reactions

Keno Theile, Student, Kühne Logistics University, Germany

Christian Hofer, Associate Professor, University of Arkansas, United States

Vinod Singhal, Professor, Georgia Institute of Technology, United States

Kai Hoberg, Professor, Kuehne Logistics University, Germany

The estimation of supply chain risk and resolution of supply chain risk has been challenging due to missing firm-level data. We propose a measure based on textual analysis of quarterly earnings calls. While SC risk has a negative effect on stock returns, we find that resolution has a positive effect.

### Invited Session

316

Wednesday, 08:00 AM - 09:30 AM, Blue Spring 2

Track: Supply Chain Risk Management

Invited Session: **Frontiers for Supply Chain Risk Management**

Chair(s): Burcu Tan Erciyas

115-0107 Capacity Investment and Pricing Strategies across International Markets under Currency Exchange Rate and Tariff Uncertainty

Murat Erkoc, Associate Professor, University of South Carolina Aiken, United States

Huaqing Wang, Associate Professor, Palm Beach Atlantic University, United States

Chunlin Wang, Lecturer, University of New Mexico, United States

Yu Xia, Professor, College of William and Mary, United States

This paper analyzes capacity investment and pricing strategies for a multinational manufacturer to hedge against exchange rate and tariff uncertainties in the competitive global market. An analytic model is built to study the duopoly competition in a foreign market with both currency exchange rate and tariff rate as exogenous variables.

115-0141 Capabilities Development for Supply Chain Resilience

Dun Li, Assistant Professor, Guizhou University, China

Bangdong Zhi, Lecturer, University of Bristol, United Kingdom

Tobias Schoenherr, Professor, Michigan State University, United States

Xiaojun Wang, Professor, University of Bristol, United Kingdom

This study examines the past, present, and future of supply chain resilience (SCR) research in the context of COVID-19. Specifically, a total of 1717 papers in the SCR field are classified into eleven thematic clusters, which are subsequently verified by a supervised machine learning approach.

115-0258 Concurrent sourcing under imperfectly visible random lead times

Thomas Cassidey, Student, University of Alabama Tuscaloosa, United States

Nickolas Freeman, Associate Professor, University of Alabama Tuscaloosa, United States

Sharif Melouk, Professor, University of Alabama Tuscaloosa, United States

We consider the case in which a manufacturer may receive an updated delivery date for components from an outsource supplier that may alter the a priori production plan using those components. We offer insights which firms can use to understand when and how to employ in-house production or expedited supply.

115-1254 Managing Product Reusability under Supply Disruptions

Prashant Chintapalli, Assistant Professor, Ivey Business School, Canada

Kumar Rajaram, Professor, UCLA Anderson School of Management, United States

Nishant K Verma, Assistant Professor, IIM Bangalore, India

We model and analyze product reusability, in the presence of supply disruptions. Our analysis shows that increasing product's reusability through better product design is beneficial to a certain extent when the probability of supply disruption increases. Doing so, when the disruption probability, could backfire and hurt firm's profits.

### Invited Session

317

Wednesday, 08:00 AM - 09:30 AM, Rainbow Spring 1

Track: Empirical Research in Operations Management

Invited Session: **Empirical Research in Innovation and Product Development**

Chair(s): Manpreet Hora Param Pal Singh Chhabra

115-0562 Knowledge Accumulation and Innovation in Buyer-Supplier Networks

Shubhobrata Palit, Assistant Professor, Esade Business School, Spain

Manpreet Hora, Associate Professor, Georgia Institute of Technology, United States

Soumen Ghosh, Professor, Georgia Institute of Technology, United States

## Wednesday, 08:00 AM - 09:30 AM

We focus on buyer firms as sources of technological knowledge for suppliers and examine the conditions under which the suppliers accumulate technological knowledge from their buyers and utilize it for their innovation.

115-0836 Patent Pendency and Future Innovative Activities

Param Pal Singh Chhabra, Assistant Professor, University of Alberta, Canada  
Manpreet Hora, Associate Professor, Georgia Institute of Technology, United States  
Karthik Ramachandran, Professor, Georgia Institute of Technology, United States

We develop an inventor's resource allocation model to allocate her effort between innovative and routine activities with belief updating about the probability of patent pendency. We find support for our hypotheses, motivated by the analytical results and tested using the USPTO data, that patent pendency negatively affects the inventor's decisions.

115-1300 Changing course: How do analogies direct pivots?

Jeremy Hutchison-Krupat, Associate Professor, University of Cambridge, United Kingdom  
Panos Markou, Assistant Professor, Darden School of Business, United States

We analyze how analogies across contexts affect the likelihood that people will pivot strategies while searching in an uncertain domain, and how this depends on the distance between the analogies. We devise an experiment and we also explore the differing roles of surface and structural analogies.

115-1440 The Effect of Voting Structure on New Product Evaluation Decisions: Advisory Committees at the FDA

Panos Markou, Assistant Professor, Darden School of Business, United States  
Tian Chan, Assistant Professor, Emory University, United States

How do voting schemes shape the discussion, vote conformity, and decision quality of an expert group? Leveraging a change in the US FDA Advisory Committees' way of evaluating new drugs and devices, we show that: simultaneous (viz-a-viz sequential) voting results in increased discussion breadth, reduced voting conformity, and improved decisions.

### Invited Session

<b>318</b>	Wednesday, 08:00 AM - 09:30 AM, Rainbow Spring 2	Track: Operational Excellence
	Invited Session: Panel: Leveraging Human Capital in the Pursuit of Operational Excellence	
	Chair(s): Fabrizio Salvador	

115-1899 Panel: Leveraging Human Capital in the Pursuit of Operational Excellence

Fabrizio Salvador, Professor, IE Business School, Spain  
Sriram Narayanan, Professor, Michigan State University, United States  
Rachna Shah, Professor, University of Minnesota, United States

This panel brings together top OM scholars to discuss upcoming challenges to leverage human capital in the pursuit of operational excellence such as (1) digitalization of repetitive and semi-repetitive work, (2) new generations balancing between work and life, and (3) slowing natality rates and retirement putting pressure on job markets.

### Invited Session

<b>319</b>	Wednesday, 08:00 AM - 09:30 AM, Barrel Spring 1	Track: POM-Marketing Interface
	Invited Session: Platform and Omnichannel Strategies	
	Chair(s): Jiong Sun	

115-0062 Platform's information sharing strategy in a supplier encroachment context with scale economies

Pengwen Hou, Student, Tianjin University, China  
Hubert Pun, Associate Professor, University of Western Ontario, Canada  
Jun Wang, Professor, Tianjin University of Finance and Economics, China

A manufacturer outsources to an encroaching supplier; the production cost can benefit from economies of scale. Both firms sell through a common online platform; the platform has market information and decides to share information privately with the supplier.

115-1402 Omnichannel Retail and Product Return

Chenchen Di, Student, The Chinese Univ of Hong Kong, Shenzhen, China  
Mengzhou Zhuang, Assistant Professor, University of Hong Kong, China

Brick-a-mortar stores have showrooming effect and offers product information to consumers and also make it convenient for consumers to return the product. Due to this trade-off, we interestingly show that the store opening does not significantly increase sales but significantly increase effective sales (sales net return).

115-1443 Search in Omnichannel Operations via Information Design

Ailing XU, Student, HKUST, China  
Qiaochu He, Associate Professor, Southern University of Sci and Tech, China  
Ying-Ju Chen, Professor, Hong Kong University of Science and Technology, Hong Kong, China

This paper examines how firms manage consumer search and purchase behaviors in omnichannel operations via information design. We propose a sequential search model, where consumers are allowed to search either channel or both and purchase. We find that the optimal information policy takes a two- or three-interval form.

## Wednesday, 08:00 AM - 09:30 AM

115-1824 Analysis of buy online return in-store strategy with price competition

Guiyang Zhu, Post Doc/Researcher, National University of Singapore, China  
Mabel C. Chou, Associate Professor, National University of Singapore, Singapore

Motivated by the recent collaboration between Kohl's and Amazon (an e-tailer) to allow consumers to buy online and return in store (i.e., BORS), we consider two competing retailers' profit functions with and without BORS and study how BORS adoption changes consumer behavior, hence market division and the number of returns.

115-2049 Optimal content growth and monetization in online platform

Ruibing Wang, Post Doc/Researcher, Universitat Mannheim, Germany  
Yonghua Ji, Associate Professor, University of Alberta, Canada

Online platforms are becoming a popular place for viewers to watch movies and TV shows. This paper studies how an online platform can optimize the content growth and revenue management decisions (advertisement vs membership) simultaneously in order to maximize its profit.

### Invited Session

320	Wednesday, 08:00 AM - 09:30 AM, Barrel Spring 2	Track: Procurement and Supplier Management
	Invited Session: Platform and Marketplace Operations	
	Chair(s): Jaelynn Oh	

115-0468 Matching Technology and Competition in Ride-hailing Marketplaces

Kaitlin Daniels, Assistant Professor, Washington University St Louis, United States  
Danko Turcic, Associate Professor, Anderson School of Management, United States

The matching technology used by taxis influences their ability to compete with Uber. Via a novel characterization of street-hailing's wait distribution, we show street-hailing may be preferred over centralized dispatch by certain passenger types. We describe conditions under which centralizing taxi dispatch causes taxis to lose market share.

115-0665 Is Token Airdrop Effective in User Retention for Decentralized Exchanges?

Jian Li, Student, Xi'an Jiaotong University, China  
Xinyu Zang, Student, University of Florida, United States  
Xiang(Shawn) Wan, Assistant Professor, Santa Clara University, United States  
Kenny Cheng, Professor, University of Florida, United States  
Xi Zhao, Professor, Xi'an Jiaotong University, China

The prosperity of cryptoeconomics in recent years inspires the needs for reliable crypto exchange platforms. However, retaining and promoting user participation remains an immediate problem. In this study, we explore the effectiveness of token airdrop in promoting user participation on the decentralized exchange platform.

115-0892 Top or regular influencer? Contracting in live-streaming platform selling

Anyan Qi, Assistant Professor, University of Texas Dallas, United States  
Suresh Sethi, Professor, University of Texas Dallas, United States  
Liqun Wei, Assistant Professor, Central South University, China  
Jianxiong Zhang, Professor, Tianjin University, China

We analyze the contracting problem of a manufacturer who sells a product through an influencer on a live-streaming shopping platform. We derive the equilibrium contract terms and propose new contracts to improve the efficiency.

115-1054 Restaurant Delivery Platforms: Food Revenue Sharing with Delivery Cost Splitting

Jaelynn Oh, Assistant Professor, University of Utah, United States  
Chloe Glaeser, Assistant Professor, Kenan-Flagler Business School, United States  
Xuanming Su, Professor, University of Pennsylvania, United States

We study a contract between a food delivery platform and restaurants where the commission rate depends on the delivery distance. We find that a contract that not only shares the food revenue but also splits the delivery profit can coordinate the system.

### Invited Session

321	Wednesday, 08:00 AM - 09:30 AM, Rock Spring	Track: POM-Economics Interface
	Invited Session: Tutorial: Structural Estimation in Operations Management	
	Chair(s): Jong Myeong Lim	

115-2105 A Tutorial on Structural Estimation in Operations Management

Jong Myeong Lim, Post Doc/Researcher, Tuck School of Business, United States  
Park Sinchaisri, Assistant Professor, University of California Berkeley, United States  
Yannis Stamatopoulos, Assistant Professor, The University of Texas at Austin, United States  
Dayton Steele, Professor, University of Minnesota, United States

In this tutorial session, Dayton Steele (University of Minnesota), Yannis Stamatopoulos (UT Austin), Park Sinchaisri (UC Berkeley), and Jong Myeong Lim (Dartmouth) discuss various ways in which structural estimation methods are used in OM research. The session focuses on the estimation techniques, rather than the application context or the results.

# Wednesday, 08:00 AM - 09:30 AM

## Contributed Session

<b>322</b>	Wednesday, 08:00 AM - 09:30 AM, Regency Ballroom Q	Track: Revenue Management and Pricing
	Contributed Session: <b>Methodological Advances in Revenue Management and Pricing</b>	
	Chair(s): Zexing Xu Junyu Cao	

115-0057 Personalized dynamic promotional pricing: A reinforcement learning approach

Junyi DONG, Student, City University of Hong Kong, China  
Minkyu SHIN, Associate Professor, City University of Hong Kong, South Korea  
Yanzhi Li, Professor, City University of Hong Kong, Hong Kong, China

We develop a model-free offline reinforcement learning approach to designing personalized promotional pricing from observable data. The experimental results with both synthetic and real data demonstrate the superior performance of the approach over existing benchmarks.

115-0362 Online Learning and Pricing for Multiple Products with Reference Price Effects

Sheng Ji, Student, Zhejiang University, China  
Cong Shi, Associate Professor, University of Michigan - Ann Arbor, United States  
Yi Yang, Professor, Zhejiang University, China

We consider the dynamic pricing problem for multiple products with unknown demand function. Customer demand is sensitive to the price and the reference price which is formed from comparison among the prices of all products. We propose a dynamic learning-and-pricing algorithm and prove the asymptotical optimality of theoretical performance.

115-1734 Few-Shot Sales Prediction with Proxy Data: A Meta Learning Approach

Zexing Xu, Student, University of Illinois at Urbana Champaign, United States  
Linjun Zhang, Assistant Professor, Rutgers University, United States  
Xin Chen, Professor, Georgia Institute of Technology, United States

We study the problem of demand forecasting for products based on historical data with limited price dispersion and features. To address this, we leverage related information as proxy data and propose an adaptable learner with data-specific parameters. The experiment results show an improvement over the several baselines.

115-1751 Dynamic film timetabling with demand learning

Junyu Cao, Assistant Professor, University of Texas Austin, United States  
Yongchang Fu, Student, Zhejiang University, China  
Long He, Assistant Professor, National University of Singapore, Singapore  
Weihua Zhou, Professor, Zhejiang University, China

We regard the movie timetabling problem as an dynamic assortment problem where the products are available screening times, and movie-goers selects the time according to MNL model. Our work contribute to the literature by involving incompatible constraints since the screen will be occupied until the end of the current show.

## Invited Session

<b>323</b>	Wednesday, 08:00 AM - 09:30 AM, Regency Ballroom O	Track: Retail Operations
	Invited Session: <b>Digital markets</b>	
	Chair(s): Tianxin Zou	

115-0485 Probabilistic Services in Ride-hailing Platform

Di Wu, Student, Xi'An Jiaotong University, China  
Gang Li, Professor, Xi'An Jiaotong University, China  
Xiajun Pan, Associate Professor, University of Florida, United States

This paper studies two types of probabilistic service in a ride-hailing platform providing high- and low-type services: probabilistic pricing and probabilistic allocation. Remarkably, providing probabilistic service can be a win-win-win policy for riders, drivers, and the platform.

115-0491 Personalized Pricing and Signaling Quality

Guangzhi Chen, Student, Warrington College of Business, United States  
Tianxin Zou, Assistant Professor, Warrington College of Business, United States

We study the market effects of a firm's personalized pricing (PP) capabilities when some consumers are uncertain about the firm's product quality. We find that PP capabilities can weaken a high-quality firm's ability of signaling its quality with its price, which may lower its profit but raise consumer surplus.

115-1943 Platform's Private Label and Information Sharing Strategy with Search Neutrality

Jianghua Wu, Professor, Renmin University of China, China  
Jiahao Yu, Student, Renmin University of China, China

We build a supply chain where upstream supplier and downstream e-commerce platform can predict demand potential. The platform may develop its private label product to encroach the market while increasing its exposure by recommend system. We study the interaction between platform's encroachment strategy and two players' information sharing strategy.

## Wednesday, 08:00 AM - 09:30 AM

### Invited Session

<b>324</b>	Wednesday, 08:00 AM - 09:30 AM, Regency Ballroom P	Track: Disruptive Technologies and Operations Management
	Invited Session: Tutorial: AI in OM and SCM	
	Chair(s): Meng Li	

115-2136 Tutorial: AI in OM and SCM

Meng Li, Associate Professor, University of Houston, United States

Artificial intelligence (AI) has a significant impact on the operating processes of numerous companies as well as on our daily lifestyle. Spurred by the increasing availability of data, the rapid development of learning algorithms, and new optimization methodologies, an increasing number of researchers are focusing on and studying the impact of AI on the nature of operations. In this tutorial, I discuss and develop a framework for AI and review the literature in the interface of AI and operations management. I will also introduce and discuss the implementation of AI in the industry based on my industrial collaboration. Further, I identify and highlight several future research directions regarding AI from the operations perspective.

### Contributed Session

<b>325</b>	Wednesday, 08:00 AM - 09:30 AM, Silver Spring 1	Track: Data Science and Analytics
	Contributed Session: Analytics for Social Media and Marketing	
	Chair(s): Ali Tosyali	

115-0060 Virality of Malicious Content on Social Media

Saurav Chakraborty, Assistant Professor, University of Louisville, United States

Sandeep Goyal, Associate Professor, University of Louisville, United States

We use machine learning to identify and investigate key characteristics of malicious actors on social media platforms. Using these characteristics, we investigate the composition of different malicious campaigns designed to hamper business operations all over the world by applying a combination of clustering algorithms.

115-0304 Detecting fake review buyers using network structure: Direct evidence from Amazon

Ali Tosyali, Assistant Professor, Rochester Institute of Technology, United States

We use novel data in which we directly observe which products buy fake reviews and study how to identify them. We show that products buying fake reviews are highly clustered in the product-reviewer network due to their reliance on common reviewers. This allows us to detect them with high accuracy.

115-0737 Sequential Pattern Analysis in Loyalty Programs

Jin Fang, Assistant Professor, Clark University, United States

Hanxi Sun, Algorithm Developer, Hudson River Trading, United States

Junhee Kim, Assistant Professor, California State University Stanislaus, United States

This paper presents a network-based model for the sequential purchasing behavior analysis and brand prioritization problem. Our model can capture significant temporal structures and bring meaningful clustering solutions for customers' sequential purchasing paths. We also prioritize brands through a weighted hyperlink-induced topic search (HITS) algorithm to identify star brands.

115-1316 Humans, AI Agents, and Reputational Considerations: Reciprocity to Kind & Unkind Actions

Akshat Lakhiwal, Student, Indiana State University, United States

Hillol Bala, Associate Professor, Indiana University Bloomington, United States

Chewei Liu, Assistant Professor, Kelley School of Business, United States

Do users respond symmetrically to rewards, i.e., positive reciprocity, and punishments, i.e., negative reciprocity made by AI agents? A two-stage game revealed that without reputational consideration, AI agents weakened positive and negative reciprocity, being asymmetric for chatbots but not digital humans. However, with reputational consideration, only positive reciprocity weakened.

### Contributed Session

<b>326</b>	Wednesday, 08:00 AM - 09:30 AM, Silver Spring 2	Track: Inventory and Logistics Management
	Contributed Session: Order Fulfilment in E-Commerce and Omni-Channel Systems	
	Chair(s): Imen Ben Mohamed	

115-0803 Dedicated or Shared: How do Third-Party E-commerce Warehouses choose ?

Benedict Jun Ma, Student, The University of Hong Kong, Hong Kong, China

Yong-Hong Kuo, Assistant Professor, The University of Hong Kong, Hong Kong, China

Online retailers seek to outsource order fulfillment services to third-party e-commerce warehouses (3PEW) that are equipped with automation. A higher degree of automation provides consumers with better services, while retailers price higher to make up costs. We aim to study the 3PEW's choices in warehousing modes and contracts.

115-1280 Green order and preparation flexibility in omnichannel retailing

Imen Ben Mohamed, Assistant Professor, EM-Lyon, France

Yann Bouchery, Associate Professor, Kedge Business School, France

## Wednesday, 08:00 AM - 09:30 AM

Walid Klibi, Professor, Kedge Business School, France

This paper studies the preparation flexibility and its impact on order fulfillment when a retailer offering a green order delivery. Our model assesses the uncertain remaining preparation capacity per time period and the trucks residual capacities to consolidate uncertain green orders shipment with the stores' replenishment without deteriorating response time.

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115-1878 Optimizing Fulfillment and Replenishment Decisions with Order Postponement in Omnichannel Supply Chains

Bartu Arslan, Student, Eindhoven University of Technology, Netherlands

Zumbul Atan, Associate Professor, Eindhoven University of Technology, Netherlands

Albert Schrottenboer, Assistant Professor, Eindhoven University of Technology, Netherlands

We consider a single item single retail store with offline and online channels. Offline customers are lost upon stock-outs and online customer orders can be postponed to a replenishment period. We jointly optimize fulfillment and replenishment decisions. We model the problem as a Markov Decision Process to minimize total costs.

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115-2093 Scenario-based Distributionally Robust Optimization for the Stochastic Inventory Routing Problem

Yong-Hong Kuo, Assistant Professor, The University of Hong Kong, Hong Kong, China

Runjie Li, Student, Hong Kong University of Science and Technology, Hong Kong, China

Zheng Cui, Assistant Professor, Zhejiang University, China

Lianmin Zhang, Associate Professor, Shenzhen Research Institute of Big Data, China

We consider a class of the inventory routing problem in a discrete and finite time horizon, where the demand for homogeneous products at retail stores is uncertain and varies across different scenarios. We propose a scenario-based distributionally robust optimization framework to tackle this problem.

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### Invited Session

327	Wednesday, 08:00 AM - 09:30 AM, Winter Park 49	Track: Product Innovation and Technology Management
	Invited Session: Innovation in Pharmaceutical Industry	
	Chair(s): Ivan Lugovoi	

115-0195 Behavioral Aspects in the Design of Procurement Auctions

Ivan Lugovoi, Assistant Professor, Kühne Logistics University, Germany

Jurgen Mihm, Professor, INSEAD, France

Practical experience and academic research have shown that the design of a tender may have a substantial impact on its outcome. We conduct an empirical investigation of large-scale tenders of pharmaceutical products performed by German health insurance companies in order to study which tender designs influence the number of participants.

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115-1119 Breadth and depth of supply base innovativeness and its consequences on the focal firm's innovation

Shubham Singh, Student, Indian Institute of Management Bangalore, India

Anirban Adhikary, Assistant Professor, IIM Udaipur, India

Ravi Srinivasan, Associate Professor, Loyola University Maryland, United States

Krishna Sundar Diatha, Professor, Indian Institute of Management Bangalore, India

Firms increasingly seek novel inventions from their supply base. Using data from 1142 manufacturing firms and their 5800 suppliers, we investigate the effect of breadth and depth of supply base innovativeness on focal firm performance. We also investigate the moderating role of supply-base characteristics on relationships using panel data analysis.

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115-1684 Pharmaceutical-CRO Relationships: Are Strategic Partnerships the Way Forward?

Lidia Betcheva, Student, University of Cambridge, United Kingdom

Feryal ERHUN, Professor, Cambridge University, United Kingdom

Nektarios Oraiopoulos, Lecturer, Cambridge University, United Kingdom

In order to conduct clinical development in a more cost- and time-efficient manner, pharmaceutical companies have largely outsourced development to contract research organizations (CROs). To offer an analytical perspective on how pharmaceutical managers' choice of outsourcing relationship type can affect timelines, we investigate strategic partnerships and transactional arrangements.

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115-1775 Product Recalls, Past Innovations, and R&D Intensity

Ujjal Mukherjee, Associate Professor, University of Illinois Urbana-Champaign, United States

Gopesh Anand, Professor, University of Illinois Urbana-Champaign, United States

We investigate: (1) do firms' recalls intensify subsequent R&D efforts, and (2) do firms' past innovation efforts and stocks of innovation outcomes accentuate the intensification of subsequent R&D efforts? We show that firms systematically exhibit divergent innovation behavior.

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### Invited Session

328	Wednesday, 08:00 AM - 09:30 AM, Winter Park 50	Track: Socially Responsible Operations
	Invited Session: Market Considerations in Socially Responsible Operations	
	Chair(s): Iva Rashkova	

115-0869 Improving Cash-constrained Smallholder Farmers' Revenue: The Role of Government Loans

Kenneth Pay, Student, Massachusetts Institute of Technology, Singapore

Somya Singhvi, Assistant Professor, University of Southern California, United States

## Wednesday, 08:00 AM - 09:30 AM

Yanchong Zheng, Professor, Massachusetts Institute of Technology, United States

The need for immediate cash inhibits smallholder farmers from maximizing their revenue by forcing them to sell their produce at suboptimal times. This paper develops a model to examine how cash constraints influence farmers' selling decisions, as well as to analyze the efficacy of loan programs in improving revenue outcomes.

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115-0916 Manufacturer's Intervention into Secondary Market: Implications for Firm's Pricing, Refurbishing Quality, Profit and Consumer Welfare

Hailong Cui, Assistant Professor, University of Minnesota, United States

Greys Susic, Professor, Marshall School of Business, United States

We utilize an analytical model to study the manufacturer's trade-in programs. We focus on the firm's two operational levers, decisions on pricing and quality of refurbishing, and show that for most products it is optimal for the manufacturer to partially intervene into the secondary market.

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115-1080 Government Policies to Incentivize Citizen Preparedness for Supply Disruptions

Xiaoyan Zhao, Student, City University of Hong Kong, Hong Kong, China

Venus Lo, Assistant Professor, City University of Hong Kong, Hong Kong, China

Stephen Shum, Professor, City University of Hong Kong, Hong Kong, China

Governments can minimize impact of supply disruptions by subsidizing production of spare supplies during regular times or reducing citizens' cost of pre-purchasing necessities. These policies are effective under different circumstances. We present an algorithm for an approximately-optimal mixed policy, which can reduce social loss significantly compared to a single-focus policy.

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115-1278 Sustainable or Not? Role of Valuation Heterogeneity and Uncertainty on Product Line Design

Iva Rashkova, Assistant Professor, Washington University, United States

Lingxiu Dong, Professor, Olin Business School, Washington University, United States

Aaron (Yunzhe) Qiu, Assistant Professor, Peking University, China

We consider a firm developing and selling products with both traditional and sustainable quality to a heterogeneous market. We characterize the rich set of the firm's viable strategies for offering such two-dimensional quality products. We explore the effect of the sustainable valuation heterogeneity and uncertainty on the product line.

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# Wednesday, 09:45 AM - 11:15 AM

## Contributed Session

<b>331</b>	Wednesday, 09:45 AM - 11:15 AM, Celebration 1	Track: Agriculture and Food Supply Chains
	Contributed Session: Innovative Approaches in Farming	
	Chair(s): Yasel Costa	

115-0054 Understanding fresh potato ecosystems in Peru. Opportunities & challenges in the post-pandemic era.

Mario Chong, Professor, Universidad del Pacifico, Brazil  
Ana Luna, Professor, Universidad del Pacifico, Brazil  
Diana Llanos, Assistant Professor, Universidad del Pacifico, Peru  
Paolo Lopez, Assistant Professor, Universidad del Pacifico, Peru  
Celfia Obregon, Director CITE Papa, CITE Papa, Peru

The COVID-19 pandemic increases communities' vulnerability, mainly among micro and small farmers worldwide. This research focuses on the loss and waste in Peru's fresh potato supply chain, explores their actors and flows; and proposes a packaging solution, considering variables such as shelf life, gas level, absorbance, irradiance, cost, and revenue

115-0167 Compromise programming for scheduling upstream operations in sugarcane supply chains

Yasel Costa, Professor, Zaragoza Logistics Center (ESG50985993), Spain  
Marcela Morales Chavez, Assistant Professor, Universidad Libre Seccional Pereira, Colombia  
William Sarache, Professor, Universidad Nacional De Colombia, Colombia

Upstream operations in the sugarcane supply chain require synchronized scheduling of crop growth, harvesting activities and transportation to mills. To this end, this study proposes multi-objective stochastic optimization model that considers sustainable goals. Computational results show that it is possible to find a suitable balance between mechanical and manual harvesting.

115-1385 Profit-Making or Profit-Sharing? The Implication of Quality Testing in Milk Supply Chain

Samir Biswas, Student, Indian Institute of Management Calcutta, India  
Preetam Basu, Senior Lecturer, Kent Business School, United Kingdom  
Balram Avittathur, Professor, Indian Institute of Management Calcutta, India

Milk adulteration is a serious concern affecting public health. Farmers resort to adulteration to increase the perceived quality of milk. This paper compares two milk supply chain models, profit making vs profit sharing, and analyses the impact of quality testing to ensure high-quality milk from the farmers.

115-1806 Value chain mapping: the case of yerba mate in South America

Eduardo Contani, Professor, Londrina State University, Brazil  
Vera Sugihiro, Professor, state university of Londrina (UEL), Brazil  
Saulo Amâncio-Vieira, Professor, Londrina State University, Brazil  
Daniela Mayumi, Student, State University of Londrina, Brazil  
André Bertolino, Professor, Federal Institute of Parana, Brazil

We examine the production and processing of yerba mate in South America. The traditional production and trade of yerba mate has evolved in recent years to include more processing techniques as well as how to expand yerba mate applications and potential opportunities for further sustainable value chain.

## Invited Session

<b>332</b>	Wednesday, 09:45 AM - 11:15 AM, Celebration 2	Track: Energy and Natural Resource Management
	Invited Session: Emerging topics in renewable energy and electric vehicles	
	Chair(s): Sebastian Souyris	

115-0188 Evaluating Utility Investments in Renewable Energy with Uncertain Carbon Costs

Tom Palley, Student, Kelley School of Business, United States  
Asa Palley, Assistant Professor, Kelley School of Business, United States

We develop a model based on analysis of a well-established integrated assessment model to study how evolving information about SCC affects a policymaker's decision to set a carbon tax and a representative utility's subsequent investments in renewable energy capacity.

115-0333 Utilities' Managed Home-Charging Programs for Electric Vehicles

Ali Fattahi, Assistant Professor, Johns Hopkins University, United States

Utilities have designed managed home-charging programs to control the charging times of electric vehicles (EVs). These programs are either active (utility directly manages the EV charging) or passive (utility indirectly influences the charging times by offering different prices). We study jointly designing and executing these programs.

115-0610 Diffusion of Residential Solar Power Systems: A Dynamic Discrete Choice Approach

Sebastian Souyris, Assistant Professor, Rensselaer Polytechnic Institute, United States  
Jun Duan, Associate Professor, University of Texas Austin, United States  
Anantaram Balakrishnan, Professor, University of Texas Austin, United States  
Varun Rai, Associate Professor, University of Texas Austin, United States

## Wednesday, 09:45 AM - 11:15 AM

We study the diffusion of solar photovoltaic systems by modeling the adoption decisions of forward-looking households. The space-time dynamics reveal a clear pattern that the adopters influence a household's adoption decision in their neighborhood. Furthermore, counterfactual analysis generates insights into what incentive programs are more effective in accelerating the diffusion.

115-0613 Virtual Microgrids: Peer-to-peer Trading of Renewable Energy

Soulchan Lee, Assistant Professor, Michigan Technological University, United States  
Alexandar Angelus, Assistant Professor, Texas A&M University College Station, United States  
Chelliah Sriskandarajah, Professor, Texas A&M University College Station, United States

A virtual microgrid refers to a decentralized network of electricity prosumers (i.e., consumers with proprietary generation sources) organized for the peer-to-peer trading of electricity. In this paper, we derive the optimal level of generation capacity investment in a virtual microgrid and compare its cost performance to other centralized microgrid systems.

### Invited Session

333	Wednesday, 09:45 AM - 11:15 AM, Celebration 3	Track: Healthcare Operations Management
	Invited Session: Analytics for Efficient Healthcare Operations	
	Chair(s): Mehmet Ayvaci Mehmet Eren Ahsen	

115-1571 Centralized versus Decentralized Patients' Treatment: Which Is Better? Differential Games Analysis of COVID-19 Medical Services

Dehai Liu, Professor, Dongbei University of Finance and Economics, China  
Li tianjiao, Student, Temple University, United States

Centralized and decentralized treatments are the main methods of the COVID-19 control. Centralized treatment in designated hospitals is better in large-scaled patients' treatment, but it is easy to cause patients gathering and severe hospital beds shortage. Decentralized treatment can divide patients rationally into square-cabin hospitals and designated hospitals.

115-1597 Pooled Testing in the Presence of Congestion

Bingnan Lu, Post Doc/Researcher, National University of Singapore, Singapore  
Saif Benjaafar, Professor, University of Minnesota, United States  
Benjamin Legros, Associate Professor, EM Normandie, France  
Oualid Jouini, Professor, Université Paris-Saclay, CentraleSupélec, France

We investigate the optimal batch size for a testing facility that diagnoses infected individuals with pooled testing to minimize total waiting time for results. We provide conditions for system stability and develop an algorithm to obtain the batch size for minimizing test result delays.

115-1609 Will Machines Take Over? Algorithms for Human-Machine Collaborative Decision Making in Healthcare

Mehmet Ayvaci, Associate Professor, University of Texas Dallas, United States  
Radha Mookerjee, Assistant Professor, University of Texas Dallas, United States  
Mehmet Eren Ahsen, Assistant Professor, University of Illinois at Urbana-Champaign, United States

We study a healthcare system's problem of when, if, and how to use human-machine collaborative decision-making in the context of mammography imaging. We propose an optimization model for the healthcare system that minimizes costs related to mammography screening. We apply our model in a real word data competition in mammography.

115-1770 Mitigating the Socio-economic, Demographic and Clinical Diversity Driven Spatial Disparity of COVID-19 Mortality

Bhupinder Juneja, Senior Lecturer, University of Minnesota, United States  
Ujjal Mukherjee, Associate Professor, University of Illinois Urbana-Champaign, United States  
Kingshuk Sinha, Professor, University of Minnesota, United States

A widespread spatial disparity of mortality from the COVID-19 exists. The spatial disparity in mortality is associated with socio-economic, demographic, and clinical diversity of populations. We demonstrate that policy decisions for critical care and vaccines allocation that account for risk factors can mitigate disparity in mortality.

### Contributed Session

334	Wednesday, 09:45 AM - 11:15 AM, Celebration 4	Track: Healthcare Operations Management
	Contributed Session: Healthcare for Social Good	
	Chair(s): Harwin De Vries	

115-0532 A Field Experiment to Relief Cash Constraints at Community Health Entrepreneurs

Lisanne van Rijn, Student, Erasmus School of Economics, Netherlands  
Harwin De Vries, Assistant Professor, Rotterdam School of Management, Netherlands  
Luuk Veelenturf, Associate Professor, Rotterdam School of Management, Netherlands

Community health entrepreneurs (CHEs) sell health products in small rural stores, but frequently report stock-outs. We conduct a field experiment in Kenya in collaboration with social enterprise Healthy Entrepreneurs to improve the availability of health products. We test two interventions: a business game and decentralized consignment stock locations.

115-0829 Incentive Schemes for Mobile Outreach Units

Harwin De Vries, Assistant Professor, Rotterdam School of Management, Netherlands  
Lotty Duijzer, Lecturer, Erasmus University Rotterdam, Netherlands

## Wednesday, 09:45 AM - 11:15 AM

We study incentive schemes for mobile outreach units delivering healthcare in remote areas. Commonly applied schemes disincentivize units working together to improve the allocation of tasks. We propose novel schemes, prove when they are optimal, and numerically assess them in the context of family planning outreach services in LMICs.

115-1087 Treatment Planning of Victims with Heterogeneous Time-sensitivities in Mass Casualty Incidents

Yunting Shi, Student, Shanghai Jiao Tong University, China  
Nan Liu, Associate Professor, Boston College, United States  
Guohua Wan, Professor, Shanghai Jiao Tong University, China

Mass casualty incidents lead to a sudden jump in patient demand, making it inevitable to ration medical resources. Informed by a unique timestamps dataset collected during a large-scale earthquake, we develop data-driven approaches to plan treatment of victims with heterogeneous time-sensitivities to do the greatest good to the greatest number.

115-1462 Deploying Decision Support Analytics for Healthcare and Criminal Justice Settings

Pengyi Shi, Associate Professor, Purdue University, United States  
Xiaoquan Gao, Student, Purdue University, United States  
Griffin Carter, Student, Purdue University, United States  
Jonathan Helm, Associate Professor, Kelley School of Business, United States

I will discuss two ongoing efforts in deploying predictive and prescriptive analytics to support decision makings. The first one is for resource nurse scheduling and deployment in the largest hospital system in Indiana. The second is to support staffing planning and follow-up treatments for individuals in community corrections.

### Invited Session

335	Wednesday, 09:45 AM - 11:15 AM, Celebration 5	Track: Healthcare Analytics
	Invited Session: <b>Dynamic Decision Making in Healthcare</b>	
	Chair(s): Eojin Han	

115-0967 Personalized and Probabilistic Modelling of the Risk of Hospital Admission in an Emergency Department

Siddharth Arora, Lecturer, University of Oxford, United Kingdom  
James Taylor, Professor, University of Oxford, United Kingdom

We propose a personalised and probabilistic modelling framework to model remotely the triage category and the risk of hospital admission for patients attending an emergency department during the pandemic. We perform external independent validation and use explainable machine learning to gain insight into the key model predictors.

115-1077 Optimizing Hospital Bed Assignments in Real-Time for a Hospital Command Center

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

We report on our research with a large, highly utilized hospital to coordinate bed assignments. These decisions are complicated by patients' varying care needs and rooms/beds' distinct features. To overcome these challenges, we develop and implement an optimization model that leverages operational practices with real-time patient and system information.

115-1100 Dynamic Capacity Management for Deferred Surgeries

Eojin Han, Assistant Professor, Southern Methodist University, United States  
Kartikey Sharma, Post Doc/Researcher, Zuse Institute Berlin, Germany  
Omid Nohadani, Director of Data Science and AI, Benefits Science Technologies, United States

Motivated by the widespread deferrals of elective surgeries due to the COVID-19, we study a dynamic surgical capacity management problem. To address uncertainty in surgery demand and patient departure, we develop two solution approaches based on robust and distributionally robust optimization. These methods are demonstrated to provide sizable improvements.

115-1756 Personalized Dynamic Treatment Selection for Type 2 Diabetes

Esmail Keyvanshokoh, Assistant Professor, Texas A&M University, United States

In this presentation, I will present new models and algorithms based on online learning theory with theoretical performance guarantees for optimizing treatment selection for patients with type 2 diabetes.

### Invited Session

336	Wednesday, 09:45 AM - 11:15 AM, Celebration 6	Track: Healthcare Analytics
	Invited Session: <b>Operational Failures and Standardization in Healthcare Processes</b>	
	Chair(s): Larry Fredendall	

115-0013 When Is Standardization Most Beneficial for Reducing Medical Errors? The Moderating Role of Operational Failures

Sarah Zheng, Assistant Professor, University of Victoria, Canada  
Qi Wang, Student, Xi'an Jiaotong University, China  
Anita Carson, Professor, Boston University, United States  
Jo Holt, Assistant Professor, Vanderbilt University, United States

## Wednesday, 09:45 AM - 11:15 AM

This paper investigates how operational failures interact with a commonly implemented program - standardization of processes and equipment -- to impact medical errors using existing survey data from over 50 U.S. hospitals and a second dataset comprised of objective clinical data from over 20,000 ICU patient visits.

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### 115-0368 Do New Partner and Procedure Exposure Influence Operating Room Nurse Turnover?

Jaeyoung Kim, Student, Clemson University, United States  
Ahmet Colak, Assistant Professor, Clemson University, United States  
Lawrence Fredendall, Professor, Clemson University, United States

Knowledge workers learn from performing new tasks and working with new partners, which may improve operational outcomes. However, a side effect is a more challenging work environment because of the need to process more information (task or social information). We operationalize these variables and examine how they affect nurse turnover.

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### 115-0987 Examining Performance of a Sterile Processing Department

Lawrence Fredendall, Professor, Clemson University, United States  
Kevin Taaffe, Associate Professor, Clemson University, United States  
Sayed Islam, Student, Clemson University, United States  
Gabe Segarra, Post Doc/Researcher, Medical University of South Carolina, United States  
Sudeep Hegde, Assistant Professor, Clemson University, United States

The Sterile Processing Department (SPD) of a hospital is an integral part of the internal supply chain for surgical procedures in the operating room. This paper analyzes instrument reprocessing data to examine the effectiveness of one hospital's SPD process and identify areas for flow improvement.

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### 115-1017 Deadline Effect in Stroke Patient Care

Brandon Lee, Assistant Professor, University of Dayton, United States  
Seokjun Youn, Assistant Professor, University of Arizona, United States  
Lawrence Fredendall, Professor, Clemson University, United States

TPA (Tissue Plasminogen Activator) for stroke patients should be administered within 4.5 hours of symptom onset. The clinicians' time for the administration of TPA depends on how much time is remaining before the 4.5 hours are fully spent (i.e., deadline effect). We examine the circumstances that mitigate such deadline effect.

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### 115-1793 The Impact of Extending Treatment Time in the Emergency Department

Sebastian Alvarez Avendaño, Student, University of Wisconsin-Madison, United States  
Amy Cochran, Assistant Professor, University of Wisconsin-Madison, United States  
Keith Kocher, Assistant Professor, University of Michigan, United States  
Brian Patterson, Assistant Professor, University of Wisconsin-Madison, United States  
Gabriel Zayas-Caban, Assistant Professor, University of Wisconsin-Madison, United States

Admission decisions in the Emergency Department (ED) are not always determined by clinical factors. We investigate whether admission decisions could be improved by extending how long a patient is treated. We found that extending ED treatment time may decrease preventable admissions without greatly impacting revisits, readmissions, and waiting times.

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## Invited Session

337	Wednesday, 09:45 AM - 11:15 AM, Celebration 7	Track: Sustainable Operations Management
	Invited Session: <b>Business and Climate Change</b>	
	Chair(s): Christian Blanco	

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### 115-0518 Empirical Analysis of Firm-level Carbon Reduction Commitments

Donghyun (Daniel) Choi, Student, Georgia Institute of Technology, United States  
Abhinav Shubham, Student, Georgia Institute of Technology, United States  
Manpreet Hora, Associate Professor, Georgia Institute of Technology, United States

An increasing number of firms are joining Science-Based Target (SBT) initiatives and pledging to set carbon reduction or net-zero targets. We identify the antecedents of setting SBTs. Merging the historical SBTs with firm-level financial and environmental performance data, our findings unravel insights on antecedents and consequences.

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### 115-0607 Analyzing Article 6 of the Paris Agreement: A Model of Trade in Carbon Mitigation Outcomes

Manish Tripathy, Post Doc/Researcher, Sauder School of Business, UBC, Canada  
Sanjith Gopalakrishnan, Assistant Professor, McGill University, Canada  
Harish Krishnan, Professor, University of British Columbia, Canada

The Paris Agreement's Article 6 allows country A to facilitate carbon emission reduction in country B and claim this reduction in A's (not B's) national emissions. This trade in Internationally Transferred Mitigation Outcomes (ITMOs) is debated and misunderstood. We model ITMOs and analyze their impact on economic output and emissions.

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### 115-0876 Decarbonizing OCP: Towards Industrial Decarbonization via Robust Solar Capacity Expansion

Vasileios Digalakis, Student, Massachusetts Institute of Technology, United States  
Dimitris Bertsimas, Professor, MIT Operations Research Center, United States  
Ryan Cory-Wright, Assistant Professor, Imperial College London, United Kingdom

## Wednesday, 09:45 AM - 11:15 AM

We introduce a machine learning- and robust optimization-based methodology for solar capacity expansion, which we develop in collaboration with OCP, a large fertilizer producer, to guide their \$1Bn investment in solar energy. Our model reduces OCP's carbon emissions by 60% and saves \$2.5Bn in operational costs over 20 years.

115-2103 Constructing energy-efficient railway timetables via a robust mixed integer optimization approach

Shuvomoy Das Gupta, Student, Massachusetts Institute of Technology, United States

We present a data-driven robust mixed integer optimization model to construct energy-efficient railway timetables. We apply our model to the UK Docklands Railway system spanning a full day involving thousands of active trains, and find that our model finds an optimal timetable with a significant reduction in energy consumption.

### Contributed Session

338	Wednesday, 09:45 AM - 11:15 AM, Celebration 8	Track: Sustainable Operations Management
	Contributed Session: Empirical Research in Sustainable Operations Management	
	Chair(s): Erin McKie	

115-0749 Using Text Analytics to Classify Quantify the Impact of Social Sustainability in Global Supply Chains

Soh Hyun Chu, Student, Ohio State University, United States  
Christian Blanco, Assistant Professor, Ohio State University, United States  
James Hill, Associate Professor, Ohio State University, United States

This study attempts to identify the most severe social sustainability issues within the global supply chains of publicly traded companies. Analyzing news articles from 1990 to 2020, we gauge the severity of social sustainability issues, using statistical methods to measure the impact of an event on firm value.

115-1501 How do Curbside Feedback Tactics Impact Households' Recycling Performance? Evidence from Community Programs

Erin McKie, Assistant Professor, Ohio State University, United States  
Aravind Chandrasekaran, Professor, Ohio State University, United States  
Sriram Venkataraman, Associate Professor, University of South Carolina, United States

In this research, we examine the role of two popular feedback mechanisms in correcting households' curbside recycling behaviors. Our analysis leverages econometric methods, and recycling performance data from 25,359 audits across 11,899 households and 15 recycling routes. We discuss the implications of our findings for both research and policy.

115-1656 Supply Chain Relationship Impacts on Firm Environmental ESG Practices

Marcus Bellamy, Assistant Professor, Boston University, United States  
Erin McKie, Assistant Professor, Ohio State University, United States  
Elliot Bendoly, Professor, Ohio State University, United States

Supply chain relations can play major roles in influencing firms' environmental efforts. We examine how changes in firms' and supply chain members' environmental performance occur over a 10-year period. We discuss implications for firms' engagement and selection criteria and external stakeholders' efforts to manage environmental practices across supply chains.

115-1892 Learning to Reduce Industrial Water Consumption

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

Using factory-level data from a large multinational manufacturer, we examine the effects of organizational experience on an increasingly critical environmental performance measure, the consumption of water required for manufacturing. We examine several learning effects including own learning, vicarious learning from others, and learning by benchmarking.

### Invited Session

339	Wednesday, 09:45 AM - 11:15 AM, Celebration 9	Track: Supply Chain Management
	Invited Session: Data-Driven Inventory and Supply Chain Management Models	
	Chair(s): Shi Chen	

115-0360 A Simple Data-Driven Policy for Inventory Systems with Backlogging and Demand Covariates

Jingkai Huang, Student, Zhejiang University, China  
Kevin Shang, Professor, Duke University Durham, United States  
Yi Yang, Associate Professor, Zhejiang University, China  
Weihua Zhou, Professor, Zhejiang University, China

We study a single-stage inventory system in which demand depends on exogenous features in the finite horizon. Lead time is positive and unfilled demands are fully backlogged. We propose an effective data-driven heuristic policy based on feature aggregation and sample average approximation and show its near-optimality.

115-0387 No-Regret Learning in Two-Echelon Inventory Systems: Supply Chain Coordination with Unknown Demand Distribution

Shi Chen, Associate Professor, Michael G. Foster School of Business, United States  
Haipeng Luo, Assistant Professor, University of Southern California, United States

## Wednesday, 09:45 AM - 11:15 AM

Yingfei Wang, Assistant Professor, University of Washington, United States

Mengxiao Zhang, Student, University of Southern California, United States

We aim at designing online learning algorithms for the supply chain coordination problem with an unknown demand distribution, which brings distinct features as compared to classic online optimization problems. We design algorithms that achieve favorable guarantees for regret and convergence to the optimal inventory decisions in centralized and decentralized settings.

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115-0443 Inventory Control and Learning for One-Warehouse Multi-Store System with Censored Demand

Recep Bekci, Student, McGill University, Canada

Mehmet Gumus, Professor, Mcgill University, Canada

Sentao Miao, Assistant Professor, McGill University, Canada

We study an inventory control problem called One-Warehouse Multi-Store system with unknown demand distribution. This system has a central warehouse that receives initial replenishment and distributes its inventory to multiple stores in each period during a finite horizon. Results show that the proposed algorithms have significant theoretical and empirical performances.

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115-1378 A Unified Parsimonious Model for Structural Demand Estimation Accounting for Stockout and Substitution

Yiting Deng, Assistant Professor, University College London, United Kingdom

Yuexing Li, Assistant Professor, Johns Hopkins University, United States

Jeannette Song, Professor, Duke University, United States

We develop a unified parsimonious model for structural estimation of demand parameters in the presence of stockout and non-stationary customer arrivals when the unit of purchase can take any continuous quantity. Our approach yields more accurate demand predictions and much higher profits and consumer surplus than that ignoring stockout.

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### Contributed Session

340	Wednesday, 09:45 AM - 11:15 AM, Celebration 10	Track: Supply Chain Management
	Contributed Session: Platform and E-commerce	
	Chair(s): Hao Su	

115-0019 Supplier Channel Choice via On-Line Platform

Stephen Gilbert, Professor, McCombs School of Business, United States

Parshuram Hotkar, Assistant Professor, Indian School of Business, India

Chuanjun Liu, Student, Fudan University, China

Several major on-line retail platforms operate both reselling and agency channels . We explore when and why the platform and a supplier would interact via the platform's agency vs. its reselling channel. We consider competition among traditional resellers and the possibility that the platform can reach additional consumers.

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115-0112 To encroach on add-on marketplaces or not? Interactions between add-on pricing and distribution channel figuration

Ruiying Yuan, Student, Tianjin University, China

Zhaofang Mao, Professor, Tianjin University, China

Zhe Yang, Student, Tianjin University, China

We build a game-theory model of a manufacturer and a platform, to analyze the platform's incentives to enter an add-on market and its decision on the distribution channel figuration. Interestingly, we identify the condition where the platform still prefers encroaching even if no consumers buy the self-operated add-on (fake move).

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115-1167 The Impact of the Rivalry Behaviors among the Vertical Partners on Their E-Commerce Performance

Woohyun Cho, Associate Professor, University of New Orleans, United States

Hao Su, Assistant Professor, University of New Orleans, United States

We examine the impact of the relationship between the individual merchants' make or buy decisions and corresponding reactions of the online marketplace operator (i.e., Amazon.com) on the sales performance. Our study contributes to literature that significantly neglects the role of rivalry behaviors among the vertical partners on related outcomes.

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115-2124 The Economics of Bestsellers: Consumer Search, Sales Ranking, and Social Learning

Wentao Lu, Post Doc/Researcher, Carey Business School, United States

Man Yu, Professor, Hong Kong University of Science and Technology, China

Motivated by e-commerce platforms' diverse practices in bestseller information provision, we examine consumers' learning, searching, and purchasing behavior. Our results suggest that the platform may withhold some bestseller information at the cost of consumers.

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### Invited Session

341	Wednesday, 09:45 AM - 11:15 AM, Celebration 11	Track: Manufacturing Operations
	Invited Session: Disruptive Technologies	
	Chair(s): Haoying Sun Yunke Mai	

115-0367 Is Your Machine Better Than You? You May Never Know.

Francis De Vericourt, Professor, ESMT Berlin, Germany

Huseyin Gurkan, Assistant Professor, ESMT Berlin, Germany

## Wednesday, 09:45 AM - 11:15 AM

This paper explores the extent to which a decision maker (DM) supervising a machine to make high-stake decisions can properly assess whether the machine produces better recommendations. To that end, we study a set-up in which a machine performs repeated decision tasks under the DM's supervision.

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### 115-0618 The Impact of Mask Mandate Ban

Qili Wang, Student, University of Florida, United States  
Xinzhi Rao, Student, University of Florida, United States  
Liangfei Qiu, Associate Professor, University of Florida, United States

In May 2021, the government announced Mask Mandate Ban in school districts. In this paper, we examine the causal effect between Mask Mandate Ban and Covid-19 transmission in public elementary and middle schools. Furthermore, we investigate the effects of moderating factors on the impact of the ban on mask mandates.

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### 115-1227 Tokenomics: Controlling Non-Fungible Token Supply in Play-to-Earn Games

Youngsoo Kim, Assistant Professor, University of Alabama Tuscaloosa, United States  
Yunke Mai, Assistant Professor, University of Kentucky, United States

This paper studies the long-run operating policies for a play-to-earn game enabled by the NFT technology. We build a dynamical model to capture the economic system in such a game and utilize control theory to characterize the optimal rationing of in-game token supply to sustain a healthy economy.

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### 115-1972 Intentional Deviation from Prescribed Procedures: A Study of Large-Scale Manufacturing Organisations

Neha Tewari, Student, Cranfield School of Management, United Kingdom  
Anurag Tewari, Assistant Professor, University of Washington Bothell, United States

Organizational actors often intentionally drift away or deviate from prescribed procedures. Multiple exogenous and endogenous factors shape the actor's intentionality to drift. We empirically investigate 197 cases of drifted actions from 31 large-scale manufacturing organizations to arrive at an ordered list of dominant factors leading to intentional drift in procedures.

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## Contributed Session

342	Wednesday, 09:45 AM - 11:15 AM, Celebration 12	Track: Humanitarian Operations and Crisis Management
	Contributed Session: Location/Network Design	
	Chair(s): Christopher Zobel	

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### 115-0731 Humanitarian shelter network design and evacuation planning problem: An application to flood preparedness in Haiti

Maedeh Sharbaf, Student, HEC Montréal, Canada  
Valérie Bélanger, Associate Professor, HEC Montréal, Canada  
Marie-Eve Rancourt, Associate Professor, HEC Montréal, Canada

We present a decision-support tool for flood preparedness developed through a collaboration with the World Bank in Haiti. The shelter network design and evacuation planning problem is formulated as a stochastic bi-level optimization model with time-varying characteristics (e.g., evacuee behavior and disaster propagation) and tested using socio-demographic and GIS data.

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### 115-0995 A Robust Model for the Well Location Problem: applying in The Brazilian Northeast Region's droughts

Dayanna Nunes, Student, INSTITUTO MILITAR DE ENGENHARIA, Brazil  
Orivalde Silva Júnior, Assistant Professor, INSTITUTO MILITAR DE ENGENHARIA, Brazil  
Renata Bandeira, Assistant Professor, INSTITUTO MILITAR DE ENGENHARIA, Brazil  
jesus vieira, Student, INSTITUTO MILITAR DE ENGENHARIA, Brazil

This study propose a robust stochastic model for the location of artesian wells for the relief of drought-affected population, considering demand's uncertainty. The goal is to maximize social benefits, prioritizing the most vulnerable communities through a composite drought risk index, while maximizing the probability of success in water prospecting.

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### 115-1738 Creating Resilient Logistic Networks for Natural Disaster Relief

Andy Arnette, Associate Professor, Virginia Tech, United States  
Christopher Zobel, Professor, Virginia Tech, United States  
Michael Whitehead, Government Operations & Planning Integration Manager, American Red Cross, United States  
Kiatikun Luangkesorn, Volunteer - NHQ/National Planner, American Red Cross, United States

Based on work with the American Red Cross, we discuss an approach for deploying and staging people and supplies for response to a natural disaster. We focus on improving the ability to respond efficiently to deviations from the original plan, based on the disaster's scale and impact on infrastructure.

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## Contributed Session

343	Wednesday, 09:45 AM - 11:15 AM, Celebration 13	Track: Humanitarian Operations and Crisis Management
	Contributed Session: Empirical Coordination	
	Chair(s): Sarah Schiffling	

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### 115-0323 Managerial Mindset or Organizational Purpose? Comparing How Non-profit and For-profit Managers Address Societal Ills

Anton Shevchenko, Associate Professor, Concordia University, Canada  
Mark Pagell, Professor, University College Dublin, Ireland

## Wednesday, 09:45 AM - 11:15 AM

Sara Hajmohammad, Associate Professor, University of Ottawa, Canada

Both for-profit and non-profit organizations may seek to alleviate societal ills. Yet, strategic operations management decisions in these two contexts are often driven by different purposes and have different outcomes. We use vignette-based experiments, to disentangle whether strategic decision-making is shaped by the managerial mindset or the organization's primary purpose.

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115-0940 Standards and Cooperation in the Humanitarian Sector: Distributing Food in the Sahel

Félicia SAÏAH, Student, HUMLOG Institute, Finland

Sarah Schiffling, Assistant Professor, HUMLOG Institute, Finland

Diego Vega, Assistant Professor, HUMLOG Institute, Finland

This mixed-methods research explores the impact of standards on cooperation in humanitarian supply chains. Collaboration and cooperation across multiple actors and facilitating factors are discussed in the context of therapeutic food distribution against chronic malnutrition in the Sahel region between 2012 and 2022.

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115-1246 Rede Refugia - collaborative service among refugees and humanitarian organizations

Estevão Cristian da Silva Leite, Professor, Universidade Federal do Rio de Janeiro, Brazil

Tharcisio Fontainha, Professor, Federal University of Rio De Janeiro, Brazil

Carla Cipolla, Professor, Federal University of Rio De Janeiro, Brazil

Refugees require various services provided by different stakeholders. Therefore, this research aims to strengthen stakeholders' collaboration in refugee crises. Design Science Research, Systematic Literature Review and Design Thinking are adopted to develop and validate the Rede Refugia, a platform meeting offers and requests that facilitate refugees' reception, protection and integration.

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115-1590 Managing Emergency Operations by Public-Private Partnerships: A Pilot Study of Seminole HEART

Yue Ge, Associate Professor, University of Central Florida, United States

Sara Iman, Student, University of Central Florida, United States

Christopher Zobel, Professor, Virginia Tech, United States

Joseph Szmerekovsky, Professor, North Dakota State University, United States

Effective public-private partnerships can play an important role in the timely distribution of relief materials after a disaster. We conducted personal interviews of the Seminole HEART board members to better understand how a community-based partnership has improved the logistics of emergency planning and response with past disasters in Central Florida.

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### Invited Session

344	Wednesday, 09:45 AM - 11:15 AM, Celebration 14	Track: Service Operations
	Invited Session: Models of Services and Customers	
	Chair(s): Andrew Daw	

115-0351 Optimal Scheduling of Proactive Service with Customer Deterioration and Improvement

Yue Hu, Post Doc/Researcher, University of Chicago, United States

Carri Chan, Professor, Columbia University, United States

Jing Dong, Associate Professor, Columbia University, United States

We consider a multi-class queuing model motivated by healthcare environments, where a moderate-class patient who does not receive treatment may recover or deteriorate to an urgent class. In this setting, we quantify the benefit of proactive care and characterize how moderate and urgent patients should be prioritized for care.

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115-1036 Asymmetries of Service: Co-Production and Synchronicity

Andrew Daw, Assistant Professor, Marshall School of Business, United States

Galit Yom-Tov, Assistant Professor, Technion Israel Institute of Technology, Israel

We propose and analyze a stochastic model of service interactions that captures two (a)symmetries between the customer and agent: co-production vs self-production, synchrony vs asynchrony. This model reveals connection to the behavioral operations literature, such as non-monotonic system performance from monotonic agent-load slowdown, yielding insights for decision making and analysis.

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115-1705 Data-driven Evaluation of Alternative Sentencing Allocation

Antonio Castellanos, Post Doc/Researcher, Booth School of Business, United States

Pengyi Shi, Associate Professor, Purdue University, United States

Amy Ward, Professor, Booth School of Business, United States

Lynne Mock, Manager, Center for Community Corrections Research, ICJIA, United States

Mary Ann Dyar, Program Director, Adult Redeploy Illinois, ICJIA, United States

Adult Redeploy Illinois (ARI) provides community-based incarceration-diversion programs to reduce recidivism. ARI uses machine-learning based risk assessment to identify individuals who can benefit the most. Leveraging the ARI data, we provide a data-driven framework for modeling the ARI process, showing the tradeoffs among admission policy, program utilization and recidivism.

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115-1717 A Queueing-theoretic Framework for Evaluating Disease Transmission Risks in Service Facilities

Kang Kang, Student, University of Minnesota, United States

Sherwin Doroudi, Assistant Professor, University of Minnesota, United States

Mohammad Delasay, Assistant Professor, Stony Brook University, United States



## Wednesday, 09:45 AM - 11:15 AM

We propose a metric, system-specific basic reproduction rate, for evaluating disease transmission risk during a pandemic in small-scale settings driven by stochasticity in the arrival and service processes. We derive our metric for various queueing models of service facilities by leveraging a novel queueing-theoretic notion: sojourn time overlaps.

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### Invited Session

<b>345</b>	Wednesday, 09:45 AM - 11:15 AM, Celebration 15	Track: Information Systems and Operations Management
	Invited Session: Platform Economy	
	Chair(s): Jingjing Weng	

115-0601 Creator economy: measuring the impact of in-app purchases on multi-sided platforms

Jiayu Fan, Student, Temple University, United States

Subodha Kumar, Professor, Temple University, United States

Many multi-sided platforms (such as TikTok and Instagram) added a new feature, in-app purchases. This integration with eCommerce will change platforms' ecosystem and their strategy on ads price and policy of revenue sharing. My research investigates how the shopping function impacts the creator economy and gives managerial insights.

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115-1143 Blockchian adoption in manufacturing supply chain

mahak sharma, Assistant Professor, BIMTECH, India

Karuna Jain, Professor, Indian Institute of Technology Bombay, India

The present work tries to investigate factors that impact blockchain adoption in the manufacturing supply chain in the Indian context. Mixed-method sequential approach is used. DEMATEL analysis highlights that "Lack of reference architecture" and "Lack of technical expertise" lies in the cause group and need immediate attention for timely blockchain-adoption.

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115-1257 Strategic Blockchain Adoption with Brand Competition: Impact of Deceptive Counterfeit

Jingjing Weng, Student, Temple University, United States

Subodha Kumar, Professor, Temple University, United States

Counterfeiting is a significant concern for many industries, especially online channels. We investigate the impact of deceptive counterfeit and blockchain adoption on two brand-name companies' prices, demands, and profits. Based on our model, we derive the conditions under which the high-quality brand-name company should adopt blockchain technology.

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115-2001 Value of Blockchain And IoT Technologies in Supply Chain of Perishable Goods

Vinaysingh Chawan, Assistant Professor, Indian Institute of Management Indore, India

Prageet Aeron, Assistant Professor, Management Development Institute Gurgaon, India

We consider an IoT enabled supply chain of perishables, where the security and integrity of devices data is ensured via the blockchain. The blockchain further helps in implementing smart contracts. A simulation based model is used to do cost-benefit analysis of these technologies in the supply chain of perishables.

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### Invited Session

<b>346</b>	Wednesday, 09:45 AM - 11:15 AM, Coral Spring 1	Track: Emerging Topics in Operations Management
	Invited Session: Making an Impact Using Applied OM	
	Chair(s): Chris Parker	

115-0745 Seeing is Trusting? The Effects of Supply Chain Transparency on a Consumer Marketplace

Jane Jiang, Student, University of Maryland - College Park, United States

Wedad Elmaghraby, Professor, Robert H. Smith School of Business, United States

Ken Moon, Assistant Professor, The Wharton School, United States

We study whether the supply chain transparency created by blockchain tracing increases consumer trust on online food marketplaces. We find empirically that in a marketplace where consumer trust is low, products adopted tracing benefit from improved trust. When consumer trust is comparatively higher, supply chain transparency serves to educate consumers.

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115-1829 Allocation of institutional donations among humanitarian organizations

Hasti Rahemi, Student, University of Colorado Boulder, United States

David Drake, Assistant Professor, University of Colorado Boulder, United States

Institutional donors employ a variety of allocation criteria to determine how to allocate their funds among humanitarian organizations. In this study, we investigate how and when donors' focus on different allocation criteria incentivizes competing HOs to spend their funds in ways that benefit their beneficiaries in the long run.

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115-2069 Vision Zero: Data-Driven Street Safety

Chris Parker, Associate Professor, American University, United States

Karthik Balasubramanian, Assistant Professor, Howard University, United States

Vision Zero (VZ) is a successful European initiative that seeks to bring the number of traffic deaths to zero. Many US cities have nominally adopted VZ but have struggled to meet the goal. We aggregate and analyze both public and private data in Washington DC towards this end.

# Wednesday, 09:45 AM - 11:15 AM

## Contributed Session

347	Wednesday, 09:45 AM - 11:15 AM, Coral Spring 2	Track: Global Supply Chain Management
	Contributed Session: Digitalization and supply chain disruption in global context	
	Chair(s): Dmitry Ivanov	

115-1673 Mapping the Supply Chain: The Automation Challenge

Bart MacCarthy, Professor, University of Nottingham, United Kingdom

Güven Demirel, Associate Professor, Queen Mary University of London, United Kingdom

Many contemporary supply chain challenges require supply system to be mapped. We highlight the significant difficulties in automating the mapping process and discuss emerging solutions to capture and map supply systems for different purposes. In an increasingly data rich world, there are many opportunities to develop the mapping process further.

115-1681 The Digitalization of Supply Chains - The Enabling Technologies

Bart MacCarthy, Professor, University of Nottingham, United Kingdom

Dmitry Ivanov, Associate Professor, Berlin School of Economics and Law, Germany

Digitalization is a powerful megatrend impacting how we collaborate and exchange supply chain information, and how we integrate, manage and control operations. We discuss the enabling technologies including smart factories and warehouses, smart logistics, cloud-based systems, digital platforms, and computational engines powered by Analytics, Data Science and Artificial Intelligence.

115-1733 Shipping Container Imbalance and Supply Chain Disruptions: Lessons from the Pandemic

Sudipendra Nath Roy, Lecturer, University of Saskatchewan, Canada

Fredrik Odegaard, Associate Professor, Ivey Business School, Western University, Canada

Marine containerized transport serves as the backbone of product-based supply chains, and faced an alarming empty container imbalance that aggravated supply chain disruptions caused by the COVID-19 pandemic. By using container volume data, we showed how disrupted container traffic undermined marine goods transport and discussed potential solutions for future disruption.

115-1833 Semi-conductor Chip Planning and Allocation during Supply Chain Disruption Due to Covid Outbreak

Sabitha Devarajulu, Student, IIM Tiruchirappalli, India

Shalini Velappan, Assistant Professor, IIM Tiruchirappalli, India

In our research, we have developed an optimization model to decide the optimal allocation of semi-conductor chips to different vehicle lines. In addition to the optimization model, we conducted sensitivity analysis to analyze the robustness of the existing solution and make purchase and planning decisions.

## Invited Session

348	Wednesday, 09:45 AM - 11:15 AM, Blue Spring 1	Track: Supply Chain Risk Management
	Invited Session: Managing Innovation Risks in Supply Chains	
	Chair(s): Ahmet Colak	

115-0431 Geopolitical risk and international R&D alliances

Remi Charpin, Assistant Professor, Hec Montreal, Canada

Jake London, Assistant Professor, Loyola University Maryland, United States

Nicolas Vincent, Professor, Hec Montreal, Canada

Current geopolitical tensions incentivize governments to reshape supply innovation networks, which many firms rely on to innovate. This study examines how geopolitical risk influences international R&D alliances and may threaten firms' innovativeness.

115-0439 Labor Coordination and Division: Human Capital Investment in Supply Chains

Ling Cen, Associate Professor, The Chinese University of Hong Kong, Hong Kong, China

Michael Hertzfel, Professor, Arizona State University, United States

Ziang Wang, Assistant Professor, PolyU, Hong Kong, China

Jing Wu, Associate Professor, The Chinese University of Hong Kong, Hong Kong, China

We document labor coordination and division in recruiting activities of supply-chain partners consistent with relationship-specific investment in human capital. We find that recruitment by dependent suppliers caters to the needs of their major customers. Supply chain partners recruit general positions together, while pursuing labor division for specialized occupations.

115-1380 Understanding the Implications of Operational Flexibility for Electricity Grid Transition to Intermittent Generation

Seyed Amin Seyed Haeri, Student, Clemson University, United States

Ahmet Colak, Assistant Professor, Clemson University, United States

Safak Yucel, Assistant Professor, Georgetown University, United States

In this study we empirically investigate the role of operational flexibility in making a transition from conventional fossil-fueled power plants to intermittent renewable power plants (i.e., solar and wind generators). We utilize two decades worth of data on power plant investments to answer our research questions.

115-1432 Does production location impact quality? An empirical study on the generic drug quality variations

Xinyu Shirley Liang, Student, University of Michigan Ann Arbor, United States

## Wednesday, 09:45 AM - 11:15 AM

Jun Li, Associate Professor, University of Michigan - Ann Arbor, United States

In Joon Noh, Assistant Professor, Penn State University, United States

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

Nearly 40% of finished generic drugs in the US are manufactured overseas. Limited research has studied their clinical performance due to the opaqueness of the supply chain and limited access to large-scale patient outcomes data. Our study utilizes patient-level claims and drug manufacturing location data to examine the quality variations.

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115-1907 Multi-dimensional Aspects of Variety Under Shortages: Evidence from the Automobile Industry

Hojun Choi, Student, Northwestern University, United States

Ahmet Colak, Assistant Professor, Clemson University, United States

Sina Golar, Assistant Professor, Kennesaw State University, United States

Achal Bassamboo, Professor, Northwestern University, United States

Recent studies in inventory management have focused on the impacts of variety on sales performance. However, disruptions such as COVID-19 can impose replenishment constraints, preventing vendors from utilizing the insights gained in these studies. In this paper, we study the multi-dimensional aspects of variety during shortages in the automotive industry.

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### Invited Session

<b>349</b>	Wednesday, 09:45 AM - 11:15 AM, Blue Spring 2	Track: Supply Chain Risk Management
	Invited Session: Stochastic Supply Chain Models	
	Chair(s): Guiyun Feng	

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115-0648 Hazardous Materials: An Inventory Model with Risk and Safety Considerations.

Santiago Neira Mendieta, Student, Oklahoma State University, Colombia

Diana Rodriguez-C., Assistant Professor, Oklahoma State University, United States

The main objective is the development of a HAZMAT inventory model with risk and safety considerations, to determine the order quantity and the risk level of the storage conditions considering the HAZMAT regulations, the facility location, the exposed vulnerable population, the presence of fire protection systems, and the incident probability.

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115-1137 Asymptotically Optimal Policies for Dynamic Ambulance Dispatch in Emergency Medical Service System

Cheng Hua, Assistant Professor, Shanghai Jiao Tong University, China

Tong Wang, Associate Professor, Shanghai Jiao Tong University, China

Jingwei Zhang, Assistant Professor, The Chinese Univ of Hong Kong, Shenzhen, China

Ziyan Zhou, Student, Shanghai Jiao Tong University, China

We consider a dynamic ambulance dispatch problem in an emergency medical service system, in which a DM dynamically observes call arrivals, then sequentially decides which unit to be dispatched to serve the call. We consider a large penalty for each unserved request, which is rarely considered in the existing papers.

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115-1463 Online Two-stage Stochastic Optimization with Applications in Supply Chain

Jiashuo Jiang, Assistant Professor, Hong Kong University of Science and Technology, China

We consider an online two-stage stochastic optimization of a finite horizon of  $T$  periods. At each period, we need to first decide a first-stage decision, observe the realized feature afterwards, and then decide the second-stage decisions, to satisfy long-term constraints. We develop new algorithms for various stochastic input.

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### Invited Session

<b>350</b>	Wednesday, 09:45 AM - 11:15 AM, Rainbow Spring 1	Track: Empirical Research in Operations Management
	Invited Session: Empirical Research on Process and Performance Improvement	
	Chair(s): Jane Iversen	

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115-0031 Primary Care Access and Preventive Care Performance

Yingchao Lan, Assistant Professor, University of Nebraska Lincoln, United States

Jane Iversen, Student, Ohio State University, United States

Aravind Chandrasekaran, Professor, Ohio State University, United States

Overuse of resource-intensive services in the form of emergency room (ER) visits and underuse of primary care and health screenings contribute to soaring healthcare expenditures in the United States. We study how primary care access through accountable care organizations can impact preventive care performance and clinical outcomes.

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115-0422 An Empirical Investigation of Factors Influencing Performance of Decentralized Applications

Luv Sharma, Associate Professor, University of South Carolina, United States

Moonwon Chung, Assistant Professor, Cleveland State University, United States

Jie Lian, Student, University of South Carolina, United States

We identify characteristics of decentralized applications that contribute to market success.

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115-0453 Experiential Quality and Information Disparities in Hospital Choice

Ankita Shirahatti, Student, Questrom School of Business, United States

## Wednesday, 09:45 AM - 11:15 AM

Anita Carson, Professor, Boston University, United States

Structural barriers to healthcare are a major deterrent for many minority patient groups when seeking inpatient hospital care. In this study, we examine racial disparities in the usefulness of publicly reported experiential quality information in hospital preference for obstetrics patients choosing a hospital to give birth.

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115-0507 The Role of Route-Level Decisions in the Efficiency and Resilience of Airline Operations

Vishal Ahuja, Assistant Professor, Cox School of Business, United States

Yasin Alan, Associate Professor, Vanderbilt University, United States

Mazhar Arikian, Associate Professor, University of Kansas, United States

We use a passenger-level dataset and take advantage of a regulatory change to study the role of an airline's route-level decisions in the efficiency and resilience of its operations. Our analysis reveals that both the efficiency and resilience impacts of the regulatory change show wide variations across the airline's network.

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### Contributed Session

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351	Wednesday, 09:45 AM - 11:15 AM, Rainbow Spring 2	Track: Operational Excellence
	Contributed Session: Operational Excellence in fulfilment process design	
	Chair(s): Ravi Srinivasan	

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115-0225 The performance effects of holding inventory before and during the Covid-19 pandemic

Oliver von Dzengelevski, Post Doc/Researcher, Eth Zurich, Switzerland

Torbjørn Netland, Assistant Professor, Eth Zurich, Switzerland

Morgan Swink, Professor, Texas Christian University, United States

Stephan Wagner, Professor, ETH Zurich, Switzerland

We engage with the popular claim that companies would have benefitted from keeping additional inventory during the Covid-19 pandemic. Analyzing panel data of 1,003 manufacturers, we find that only companies in industries that gained in sales after the onset of the pandemic would have benefitted from increasing their inventory levels.

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115-0723 Circular Economy model for manufacturing business operations

Simon Nadeem, Lecturer, University of Derby, United Kingdom

Jose Arturo Garza-Reyes, Professor, University of Derby, United Kingdom

Piera Centobelli, Assistant Professor, University of Naples Federico II, Italy

Kristina Kim, Marketing Specialist, University of Warwick, Netherlands

JAYAKRISHNA KANDASAMY, Associate Professor, VIT University, India

Circular Economy (CE) adoption is hindered due to a lack of practical guidelines. The presented CE model for the manufacturing sector derives from the existing concept of DMAIC while amalgamating the CE with the long-standing concept of Lean. This makes CE's adoption more desirable and practical for the manufacturing sector.

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115-0945 Integrated and Hierarchical Designs for Combined Material and Capacity Control

Arno Kasper, Student, University of Groningen, Netherlands

Stefan Haeussler, Associate Professor, University of Innsbruck, Austria

Martin Land, Associate Professor, University of Groningen, Netherlands

Ruud Teunter, Professor, University of Groningen, Netherlands

This study investigates how to design combined inventory and capacity control for manufacturers that produce customized products. The current literature argues that inventory and capacity control should be organized hierarchically. Using simulation, this study develops and tests a flexible integrated design, which outperforms its hierarchical counterparts.

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115-1224 Lean Inventory and Financial Performance: Moderated Mediation Analysis of Production Efficiency and Environmental Munificence

Mamta Sahare, Student, Indian Institute of Management Indore, India

Ravi Srinivasan, Associate Professor, Loyola University Maryland, United States

Saurabh Chandra, Professor, Indian Institute of Management Indore, India

Debasish Maitra, Professor, IIM Indore, India

This work examines how and when lean inventory affects financial performance. The proposed conceptual model is tested using data from Manufacturing industry. This work provides theoretical and practical insights on the lean inventory and the contingency where it is more effective

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### Invited Session

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352	Wednesday, 09:45 AM - 11:15 AM, Barrel Spring 1	Track: POM-Marketing Interface
	Invited Session: Platforms and online marketplaces	
	Chair(s): Guangwen Kong	

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115-0676 Customer Disclosure as a Signal of Quality

Xin Wang, Assistant Professor, Hong Kong University of Science & Tech, Hong Kong, China

Xin Fang, Assistant Professor, Singapore Management University, Singapore

Xiaofang Wang, Professor, Renmin University of China, China

Yaoyao Yang, Student, Renmin University of China, China

## Wednesday, 09:45 AM - 11:15 AM

Many manufacturers not only produce for big firms, but also sell their own brands. Some e-commerce platforms allow a manufacturer to disclose its production for a big firm as a signal of its own brand's quality. We study how such disclosure affects the manufacturer, the big firm, and consumers.

115-0893 Expanding into On-Demand Markets with Airbnb of Warehousing

Soraya Fatehi, Assistant Professor, University of Texas at Dallas, United States

Anyan Qi, Assistant Professor, University of Texas Dallas, United States

Airbnb of warehousing allows a firm to flexibly tap into the excess capacities of independent warehouse providers closer to its markets and offer on-demand fulfillment services to its consumers without significant upfront costs. We study how a firm should utilize Airbnb of warehousing to expand into its on-demand markets.

115-1299 The More the Better? Operations and Incentives of an On-demand Medical Crowdsourcing Platform

Jingxuan Geng, Student, Temple University, United States

Guangwen Kong, Associate Professor, Temple University, United States

Marco Qin, Assistant Professor, Temple University, United States

Online medical crowdsourcing platforms enable patients to seek multiple opinions from doctors. We consider such a medical crowdsourcing platform that designs the optimal price and operational leverages such as a control limit on doctors' entry. We also collect data and empirically validate the results of the analytical model.

115-1786 E-commerce platform and consumer membership system

Jiang Wu, Professor, Southwestern University of Finance and Economics, China

Linxiu Hu, Student, Southwestern University of Finance and Economics, China

Xiuli He, Professor, University of North Carolina Charlotte, United States

With the rise of the sharing economy, more retailers have begun to join the e-commerce platform to expand sales channels. As an important approach to improve consumer retention, the membership system is widely used in major e-commerce platforms.

### Invited Session

353	Wednesday, 09:45 AM - 11:15 AM, Barrel Spring 2	Track: Procurement and Supplier Management
	Invited Session: <b>Intelligent Logistics</b>	
	Chair(s): Wc Benton	

115-0063 On using Progress Updates to Synchronize Component Deliveries for Automotive Assembly Amid Supply Delays

Toyin Clottey, Associate Professor, Iowa State University, United States

Wc Benton, Professor, Ohio State University, United States

COVID-19 and the war in Ukraine have made it necessary for manufacturers to consider innovative approaches to sourcing materials. We assess the value of using delivery progress updates to synchronize component deliveries for an automotive manufacturer who, amid supply delays, maintains a strategy of waiting for all components before assembly.

115-0757 Sustained Learning Under Algorithm-Driven Automation

Christina Imdahl, Assistant Professor, Eindhoven University of Technology, Netherlands

William Schmidt, Assistant Professor, Cornell University, United States

Kai Hoberg, Professor, Kuehne Logistics University, Germany

We demonstrate that an ML classification model can predict when a planner will make value-enhancing adjustments to system recommendations, but its performance weakens over time. Structuring the ML classification threshold as a newsvendor problem balancing the costs and benefits of human reviews, including the value of learning, mitigates this loss.

115-1546 A Combinatorial Auction Mechanism for Truckload Transportation Markets

Mohsen Emadikhavi, Assistant Professor, Florida Atlantic University, United States

Robert Day, Associate Professor, University of Connecticut, United States

We present a combinatorial auction/exchange market for a truckload transportation system where carriers can use a compact bid language to express their preferences to participate in the market. We present a dual-pricing mechanism that finds (epsilon-)competitive equilibrium prices and evaluate market outcomes under consideration of different practical constraints.

115-1814 Quantifying our Perspectives: Semantic Vector Space Models in a Cross-Functional Sourcing Context

Beverly Osborn, Assistant Professor, Indiana University, United States

Miscommunication is persistent when vocabulary is shared but meanings differ. This is particularly important in boundary-spanning functions such as purchasing. I address this by training word2vec models on function-specific text corpora generated by distinct professional associations, and interpreting key differences between models as differences in perspective that can influence sourcing.

### Invited Session

354	Wednesday, 09:45 AM - 11:15 AM, Rock Spring	Track: POM-Economics Interface
	Invited Session: <b>Data Driven Operations</b>	
	Chair(s): Nil Karacaoglu Simin Li	

115-0709 Vertical Product Location Effect on Sales: A Field Experiment in Convenient Stores

## Wednesday, 09:45 AM - 11:15 AM

Zahra Jalali, Student, McGill University, Canada  
Maxime Cohen, Professor, McGill University, Canada  
Necati Ertekin, Assistant Professor, University of Minnesota, United States  
Mehmet Gumus, Professor, McGill University, Canada

Through a series of three studies in a field experiment conducted at a global convenience store chain over four months, we examine the effect of vertical product location on sales and how this effect changes across various factors. Our findings from the field experiment are used to optimize planograms.

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### 115-1359 Understanding Matching Quality on Freelance Platforms Through Conversational Analytics

Jiannan Xu, Student, University of Maryland, United States  
Ashish Kabra, Assistant Professor, University of Maryland, United States  
Kunpeng Zhang, Assistant Professor, University of Maryland, United States

We develop a new framework to quantify matching quality on labor marketplaces through state-of-the-art conversational analytics. Using sentiment analysis and topic modeling tools, we uncover the relationship dynamics between clients and freelancers on a freelance platform.

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### 115-1434 The impact of government responsiveness on citizen engagement on public service platforms.

Qihua Gao, Post Doc/Researcher, Massachusetts Institute of Technology, United States  
El Ghali Zerhouni, Student, Massachusetts Institute of Technology, United States  
Yanchong Zheng, Professor, Massachusetts Institute of Technology, United States

Digital platforms are a new communication channel for governments to solicit citizens' input about public services and improve service quality. How can governments promote citizens' engagement on such platforms? Using panel data from platforms in China and the US, we examine the impact of the government's responsiveness on citizens' engagement.

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### 115-2126 Managing Multihoming Workers in the Gig Economy

Park Sinchaisri, Assistant Professor, University of California Berkeley, United States

Gig economy workers multihome by dynamically allocating their services in real-time between multiple gig platforms. We study gig workers' multihoming decisions by using machine learning methods to estimate a structural model from a ride-hailing firm's proprietary data combined with publicly reported trips data.

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## Invited Session

355	Wednesday, 09:45 AM - 11:15 AM, Regency Ballroom Q	Track: Revenue Management and Pricing
	Invited Session: Algorithmic Causal Inference and Learning II	
	Chair(s): Dennis Zhang Heng Zhang	

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### 115-0145 Online Learning and Pricing for Service Systems with Reusable Resources

Cong Shi, Associate Professor, University of Michigan - Ann Arbor, United States

We consider a price-based revenue management problem with finite reusable resources over a finite time horizon  $T$ . We propose two online learning algorithms, termed Batch Upper Confidence Bound (BUCB) and Batch Thompson Sampling (BTS), and prove that the cumulative regret upper bound is  $\tilde{O}(\sqrt{PT})$ , which matches the regret lower bound.

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### 115-0471 No-Regret Learning in Multi-Retailer Inventory Control

Xiaoyu Fan, Student, New York University, United States  
Boxiao (Beryl) Chen, Associate Professor, University of Illinois at Chicago, United States  
Wenqiang Xiao, Professor, New York University, United States  
Zhengyuan Zhou, Assistant Professor, New York University, United States

We study both the single-period and infinite-horizon inventory control with multiple retailers and lost-sales. We assume unknown demand distribution and apply stochastic gradient ascent (SGA) to learn the Nash equilibria. We propose sufficient conditions, under which SGA converges to the set of Nash equilibria almost surely and with convergence rate guarantees.

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### 115-0557 Deep Learning Based Casual Inference for Large-Scale Combinatorial Experiments: Theory and Empirical Evidences

Zikun Ye, Student, University of Illinois at Urbana Champaign, United States  
Zhiqi Zhang, Student, Washington University in St. Louis, United States  
Dennis Zhang, Associate Professor, Washington University in St. Louis, United States  
Heng Zhang, Assistant Professor, Arizona State University, United States  
Renyu Zhang, Associate Professor, The Chinese University of Hong Kong, China

We develop a novel framework combining deep learning and double machine learning to estimate the causal effect of any treatment combination for each user on the platform when observing only a small subset of treatment combinations. We show the superior performance of our method on a large-scale platform.

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### 115-1306 Experimental Design in Marketplaces: Competition and Interference

Hannah Li, Post Doc/Researcher, Massachusetts Institute of Technology, United States  
Ramesh Johari, Professor, Stanford University, United States  
Inessa Liskovich, Data Science Manager, Airbnb, United States  
Gabriel Weintraub, Professor, Stanford University, United States

## Wednesday, 09:45 AM - 11:15 AM

Online platforms often rely on experiments to aid decision-making. However, in the setting of marketplace platforms, prior work shows that treatment effect estimates can be biased due to interference effects. We develop market models to capture market dynamics and investigate the effect of interference on designs and estimators.

115-2111 Policy Learning with Adaptively Collected Data

Ruohan Zhan, Assistant Professor, Hong Kong University of Science and Technology, Hong Kong, China  
Zhimei Ren, Post Doc/Researcher, University of Chicago, United States  
Susan Athey, Professor, Stanford University, United States  
Zhengyuan Zhou, Assistant Professor, New York University, United States

Learning optimal policies from historical data enables personalization in many applications. Our work complements the literature by learning policies with adaptively collected data. We propose an algorithm with proved finite-sample regret bound, which is minimax optimal and meets our established lower bound with prior knowledge on data-collection mechanism.

### Invited Session

356	Wednesday, 09:45 AM - 11:15 AM, Regency Ballroom O	Track: Retail Operations
	Invited Session: Emerging Online Retailing Strategy	
	Chair(s): Jiaru Bai Qiang Gao	

115-0176 AI Assistant in Online Pharmacy

Tong Shen, Student, University of Connecticut, United States  
Chen Liang, Assistant Professor, University of Connecticut, United States  
Jing Peng, Assistant Professor, University of Connecticut, United States  
Mengcheng Guan, Post Doc/Researcher, Huazhong University of Science & Technology, China  
Jianbin Li, Professor, Huazhong University of Science & Technology, China

AI is increasingly popular in diagnosing diseases and recommending drugs in healthcare platforms. Leveraging the staggered adoption of an AI assistant, we find that this assistant significantly increases users' purchases, even for drugs not recommended by AI; the effect is stronger for inexperienced users and users with higher privacy concerns.

115-0200 Gamified Live-streaming: Is Avatar Better than Human Being?

Yahui Liu, Student, Donghua University, China  
Lei Wang, Assistant Professor, Penn State University University Park, United States  
Yanwen Wang, Associate Professor, University of British Columbia, Canada

We empirically examine the effect of gamified and human live-streaming on product sales and product return. We find that gamified streamer reduces both product sales and the return rate simultaneously, whereas human streamer boosts both measures. We contribute to the growing literature on the business value of AI and gamification.

115-0775 Regulation on Data-Driven Price Discrimination and Firm Compliance

Shanshan Quan, Student, Zhejiang University, China  
Eric Zheng, Professor, University of Texas Dallas, United States  
Mingzheng Wang, Professor, Zhejiang University, China

We conduct whether data-driven price discrimination exists and whether regulations banning unlawful DDPD play effects by using a unique natural experiment. We find that customers with more data are subject to higher degrees of price discrimination and though DDPD did not disappear completely, the degree decreased significantly post-regulation.

115-1797 Poverty Alleviation through Livestream Commerce

Luyi Gui, Associate Professor, University of California Irvine, United States  
Xi Lin, Student, University of California Irvine, United States  
Yixin Lu, Associate Professor, George Washington University, United States

Livestream commerce, as a tool that can enhance reach and information delivery, has been applied to alleviate poverty in rural area. In this paper, we study the interaction and decision making of the farmers, the local government, and the multi-channel network agencies who manage hosts of the livestream sales.

### Invited Session

357	Wednesday, 09:45 AM - 11:15 AM, Regency Ballroom P	Track: Disruptive Technologies and Operations Management
	Invited Session: Emerging Technology Management in Healthcare	
	Chair(s): Xianghui (Richard) Peng	

115-0600 Transforming healthcare delivery for deployed operations: Developing the business case for redistributed manufacturing in Healthcare

Victor Uwalaka, Student, University of the West of England, United Kingdom  
Wendy Phillips, Professor, University of the West of England, United Kingdom  
Christopher Howell, Post Doc/Researcher, University of the West of England, United Kingdom  
Basil Omar, Senior Lecturer, University of the West of England, United Kingdom

## Wednesday, 09:45 AM - 11:15 AM

This study explores how advanced manufacturing technologies are enabling a move away from large scale centralised production towards small-scale-novel manufacturing close to the point of need, using value stream mapping. Focusing on scale-out as opposed to scale-up, redistributed manufacturing threatens to disrupt existing business models and supply chain configurations.

115-1649 Examining IT Vendor Efficiency on Care Quality Improvement and Patient Experience

Joonghee Lee, Assistant Professor, Appalachian State University, United States

Jianliang Hao, Assistant Professor, California State University, Chico, United States

Most hospitals rely on IT vendors to implement EMRs rather than self-developing, managing the relationship with IT vendors is essential to increase its effectiveness. This study examines the impact of the IT vendor relationship on organizational performance in the hospital setting using a national sample of US hospitals and econometrics.

115-1769 The Impact of Technology Adoption on Hospital Performance

Xianghui (Richard) Peng, Associate Professor, Penn State University Erie, United States

Xinyu Wei, Assistant Professor, California State University, Chico, United States

Heng (John) Xie, Assistant Professor, California State University Sacramento, United States

Rapid technological advancements are providing more opportunities for healthcare organizations to improve their performance. This research investigates the impact of technology adoption and technology integration on hospital performance. A research framework was proposed through the lens of multiple theories. Analysis on sampled hospitals is conducted to examine the proposed framework.

115-1839 How does supply chain digital transformation drive supply chain performance?

Benjamin Agyei-Owusu, Student, Kwame Nkrumah University of Science and Technology, Ghana

David Asamoah, Associate Professor, Kwame Nkrumah University of Science and Technology, Ghana

Francis Baidoo, Associate Professor, University of Texas Rio Grande Valley, United States

This study examines how digital transformation of supply chains can enhance the performance of supply chains by highlighting the intervening role of supply chain learning and supply chain value co-creation. The proposed research model is tested using data from firms operating in the health supply chain of a developing country.

## Contributed Session

358	Wednesday, 09:45 AM - 11:15 AM, Silver Spring 1	Track: Data Science and Analytics
	Contributed Session: Analytics Applications in Operations Management	
	Chair(s): Omar Mouchtaki	

115-0034 Multi-Task Learning in Predicting Customer Life-Changing Events Based on Individual-Level Financial Transaction Data

Yanhan (Savannah) Tang Tang, Student, Carnegie Mellon University, United States

Predicting customers' unemployment occurrences helps evaluate credit risks and financial opportunities. We develop a novel hierarchical Bayesian model that exploits individual-level financial transaction data. Our proposed method enables learning across related transaction time series and dynamically grouping time series based on similarities and information extracted from transaction descriptions.

115-0908 Drawing Strategic Insights from Patents: A Machine Learning Approach

Tzu-Wen Lin, Student, University of Texas at Arlington, United States

Jayarajan Samuel, Assistant Professor, The University of Texas at Arlington, United States

Sridhar Nerur, Professor, University of Texas Arlington, United States

Strategic planning for firms in knowledge-intensive industries is a little studied area and cannot rely on traditional methods. Using a unique dataset of over 10,000 patent documents, we develop a machine learning approach to this problem and illustrate the viability of our solution for two leading telecommunication firms

115-1053 Quality vs. Quantity of Data in Contextual Decision-Making: Exact Analysis under Newsvendor Loss

Omar Besbes, Professor, Columbia University, United States

Will Ma, Assistant Professor, Columbia University, United States

Omar Mouchtaki, Student, Columbia University, United States

We study a data-driven contextual Newsvendor problem and the performance implications of quality and quantity of data. We characterize exactly the worst-case expected regret for a classical class of kernel policies and unveil new structural insights on the learning behavior of these policies.

115-1592 Data-driven Inference and Optimization for Imputing Non-observable Human Preferences in Staff Scheduling

Jiangxue Han, Student, The University of Hong Kong, Hong Kong, China

Yong-Hong Kuo, Assistant Professor, The University of Hong Kong, Hong Kong, China

We consider model uncertainty, bounded rationality and compromised infeasibility in a multi-objective staff scheduling problem simultaneously. To determine the agent's implicit preferences, a data-driven inverse optimization framework is developed. The agent is given sample schedules to rank and the ranked schedules are fed into the inverse model for inferring weights.

## Invited Session

359	Wednesday, 09:45 AM - 11:15 AM, Silver Spring 2	Track: Inventory and Logistics Management
	Invited Session: Shipment Consolidation and Order Fulfillment	
	Chair(s): Johan Marklund	



## Wednesday, 09:45 AM - 11:15 AM

115-1401 Revenue management for demand fulfillment in make-to-stock production systems

Moritz Fleischmann, Professor, University of Mannheim, Germany

Herbert Meyr, Professor, University of Hohenheim, Germany

Rainer Quante, ---, ---, Austria

Danja R. Sonntag, Associate Professor, Lund University, Sweden

We consider a make-to-stock production system with multiple customer classes. The question is whether to accept, backorder or reject a given order in anticipation of future orders. We characterize the optimal policy that maximizes expected profits and present several heuristics that are computationally tractable for realistic problem sizes.

115-1469 The value of supplier flexibility for single-sourced components in the high-tech industry

Mirjam Meijer, Assistant Professor, Kühne Logistics University, Germany

Ton De Kok, Professor, Eindhoven University of Technology, Netherlands

Willem Van Jaarsveld, Associate Professor, Eindhoven University of Technology, Netherlands

High-tech manufacturers produce multiple generations of end-products containing complex single-sourced components. We investigate the value of having alternative suppliers that the manufacturer could switch to for the next product generation if the current supplier underperforms. We show that the threat of switching incentivizes the current supplier to invest in capacity.

115-1537 Inventory control in OWMR systems with hybrid time and quantity based shipment consolidation

Filip Malmberg, Student, Lund University, Sweden

We provide an exact method to jointly evaluate and optimize inventory and shipment consolidation decisions in a continuous-review one-warehouse-multiple-retailer system with respect to costs and emissions. The warehouse uses a hybrid (time and quantity-based) shipment consolidation policy to replenish retailer groups facing stochastic demand.

115-1683 Evaluation and Control of Inventory Distribution Systems with Quantity Based Shipment Consolidation

Johan Marklund, Professor, Lund University, Sweden

Filip Malmberg, Student, Lund University, Sweden

We present an exact method for evaluation and control of one-warehouse-multiple-retailer distribution systems with quantity based shipment consolidation to groups of retailers facing Poisson demand. The method determines the inventory level distributions for all stock points and minimizes the expected inventory and shipment costs under service and emissions constraints.

### Invited Session

360	Wednesday, 09:45 AM - 11:15 AM, Winter Park 49	Track: Product Innovation and Technology Management
	Invited Session: Behavior, Incentives and Platform Design	
	Chair(s): Xiaoyang Long	

115-0788 R&D and licensing strategies in the presence of social effects in the consumer market

Weizhe Yang, Student, University of Science and Technology of China, China

Yaozhong Wu, Associate Professor, National University of Singapore, Singapore

In developing new products to the consumer market, firms can choose to purchase licenses of new technologies or to develop on their own. We study firms' R&D and licensing strategies when consumers' purchasing decisions are influenced by social effects.

115-1448 Driver behaviors in crowdshipping: An Income Opportunity Effect perspective

Nicolo Masorgo, Student, University of Arkansas, United States

David Dobrzykowski, Associate Professor, University of Arkansas, United States

Brian Fugate, Associate Professor, University of Arkansas - Fayetteville, United States

Christopher Tang, Professor, University of California Los Angeles, United States

Understanding crowdshipping drivers' behaviors is important to ensure the last mile delivery service. Using an Income Opportunity Effect perspective, this study investigates how monetary incentives and operational characteristics of a delivery task affect pre-during-post task behaviors. Econometrics analyses on a dataset retrieved from a large national retailer present new insights.

115-1703 The Choice Overload Effect in Online Recommender Systems

Xiaoyang Long, Assistant Professor, University of Wisconsin Madison, United States

Jiankun Sun, Assistant Professor, Imperial College London, United Kingdom

Hengchen Dai, Assistant Professor, University of California Los Angeles, United States

Dennis Zhang, Associate Professor, Washington University in St. Louis, United States

Online retailing firms are increasingly relying on recommender systems to help guide consumer choice. In this work, we study how the number of recommended products influences consumers' search and purchase behavior in an online recommender system via a large-scale field experiment.

115-1857 The Dark Side of Service Hierarchy: Evidence from a Natural Experiment

Zhi Cao, Student, University of Electronic Science and Technology of China, China

Meng Li, Associate Professor, University of Houston, United States

Service hierarchy has always been treated as a design to improve service efficiency. In this study, we leverage an exogenous event from a medical Q&A forum and find that the lower-level providers reduce their contributions on the forum after the establishment of the service hierarchy, compared with the higher-level providers.

361	Wednesday, 09:45 AM - 11:15 AM, Winter Park 50	Track: Socially Responsible Operations
	Invited Session: Responsible Operations	
	Chair(s): Karthik Murali	

115-0106 Informal Cross-Border Trade in Africa: Operations, Policy, and Opportunities

Jimin Park, Student, Massachusetts Institute of Technology, United States  
Michael Lim, Associate Professor, Seoul National University, South Korea  
Karthik Murali, Assistant Professor, Oregon State University, United States

Informal cross-border trade (ICBT) refers to the illegal activities of cross-border commerce conducted by unregistered small-scale traders. We examine the operations of ICBT value chain and offer policy recommendations to successfully integrate it into the formal economy. We conduct a case study based on Uganda to obtain further policy insights.

115-0298 The Economic and Environmental Impacts of the Sharing Economy Business Model

Fahimeh Chomachaei, Assistant Professor, University of Massachusetts Boston, United States  
Esther Gal-Or, Professor, University of Pittsburgh, United States  
Paolo Letizia, Associate Professor, University of Tennessee, United States  
Paolo Roma, Assistant Professor, Università Degli Studi Di Palermo, Italy

The sharing economy has received much attention to determine whether it is economically viable and environmentally friendly. We study economic and environmental impacts of the sharing economy and compare them with those of other traditional models. Our analysis shows that the sharing economy can yield a win-win outcome.

115-1219 Circular Economy and Optimal Reordering Under Stochastic Rates of Return

Sergey Naumov, Assistant Professor, Penn State, United States  
Saurabh Bansal, Associate Professor, Penn State University University Park, United States  
Daniel Guide, Professor, Penn State University University Park, United States

Circular economy can reduce primary production if stocks and flows of new and used goods are managed effectively. We conduct experiments where participants choose reordering quantity in a simulated supply chain with stochastic rates of return. The uncertainty often leads to overordering, offsetting benefits of extended product lifecycle

115-2150 Playing Fair? Environmental Impacts and Practices of Facilities in Minority Communities

Abhinav Shubham, Student, Georgia Institute of Technology, United States  
Ravi Subramanian, Professor, Georgia Tech, United States

Environmental justice researchers have found evidence of racial minorities bearing disproportionate environmental burdens. However, it is unclear how facility level operational choices contribute to this disparity. We conduct an empirical investigation into the environmental and operational choices of facilities in host communities with substantial presence of racial minority populations

# Wednesday, 11:30 AM - 01:00 PM

## Contributed Session

<b>364</b>	Wednesday, 11:30 AM - 01:00 PM, Celebration 1	Track: Agriculture and Food Supply Chains
	Contributed Session: Sustainable Farming and Food Security	
	Chair(s): Guven Demirel	

115-0561 Meteorological Drought's Influence on Water Security and its Contribution to Attaining Sustainable Development Goals

Tala Qtaishat, Associate Professor, University of Jordan, United States

Dan Bumblauskas, Associate Professor, University of Northern Iowa, United States

Jordan is threatened by severe water scarcity due to population growth and climate change. This study's purpose is to evaluate, using path analysis, the effect of drought on water security and its contribution to attaining UN-SDGs. We can conclude that climate changes affect water security and sanitation for communities.

115-0696 Can Ugly Veg Supply Chains Reduce Food Loss?

Behzad Hezarkhani, Associate Professor, Brunel University, United Kingdom

Guven Demirel, Associate Professor, Queen Mary University of London, United Kingdom

Yann Bouchery, Associate Professor, Kedge Business School, France

Manoj Dora, Professor, Anglia Ruskin University, United Kingdom

We analyze the impact of marketing misshaped fruit and vegetables, i.e. ugly veg, on food loss for different supply chain structures and using game theory. The food loss per cultivated area decreases if ugly veg is sold through a specialized retailer, while total loss might increase due to competition.

115-0889 The Effectiveness of U.S. Agriculture Export Promotion

Misty Blessley, Associate Professor, Temple University, United States

Susan Mudambi, Professor, Temple University, United States

US agricultural exports, subsidized by USDA, are important to food security and economic vitality. We study subsidy effectiveness via a proprietary dataset and conduct interviews to bring light to our quantitative results, which we structure on intellectual capital. The findings can influence public policy and managerial decision making.

115-1471 The Role of Sustainable Consumption in Food Supply Chains

Shu Guo, Lecturer, University of Liverpool, United Kingdom

The food industry creates substantial food waste every year. Compared to other stages, the consumer and retail stages are highlighted by organizations like Food and Agriculture Organization as the main causes of food waste. This paper is developed to explore the role of sustainable consumption in food supply chains.

## Invited Session

<b>365</b>	Wednesday, 11:30 AM - 01:00 PM, Celebration 2	Track: Energy and Natural Resource Management
	Invited Session: Recent Advances in Energy Operations	
	Chair(s): Alexandar Angelus	

115-0460 Pricing Under Uncertainty in Multi-Interval Real-Time Markets

Jehum Cho, Student, UCLouvain, Belgium

Anthony Papavasiliou, Professor, National Technical Univ Athens, Greece

We extend the deterministic real-time market clearing model into the one with look-ahead and an endogenous representation of uncertainty. It provides the price signal minimizing a newly defined metric using the Stochastic Gradient Descent algorithm. We present results from a case study under a scenario of significant renewable energy penetration.

115-1508 Pay It Forward: The impact of Forward Price and Quantity Contracts on Renewable Energy Investments

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

Alain Bensoussan, Professor, University of Texas at Dallas, United States

We consider a firm's investment in renewable energy under correlated, stochastically evolving price and demand for renewable energy. The first has the option to enter a forward price or quantity contract at the time of investment. We derive the resulting optimal timing and capacity of investment and quantify resulting profits.

115-1845 Microgrid Capacity Investment: Price Dependent and Independent Demand Cases and Their Comparison

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

Fariba Farajbakhsh Mamaghani, Assistant Professor, Tulane University, United States

A microgrid is a group of local generators and consumers that primarily transact with each other, buy excess demand from the grid and sell excess supply thereto. We provide a profit maximization formulation for a microgrid and reveal the effect of demand and price dependency on the optimal capacity.

# Wednesday, 11:30 AM - 01:00 PM

## Invited Session

366	Wednesday, 11:30 AM - 01:00 PM, Celebration 3	Track: Healthcare Operations Management
	Invited Session: Panel: Health Information Technology in Healthcare Operations Management: Opportunities and Ch	
	Chair(s): David Dobrzykowski Rajib Dutta	

115-2025 Panel:Health Information Technology in Healthcare Operations Management: Opportunities and Challenges in an Evolving Digital World

David Dobrzykowski, Associate Professor, University of Arkansas, United States

Rajib Dutta, Student, University of Arkansas, United States

Health information technology (HIT) is purported to improve healthcare operations management (HOM) and is established as an important research stream. But, what is next for research in this area? This panel features experienced HOM scholars, sharing their views on challenges and opportunities facing healthcare organizations as HIT adoption becomes universal.

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## Invited Session

367	Wednesday, 11:30 AM - 01:00 PM, Celebration 4	Track: Healthcare Operations Management
	Invited Session: Operational Efficiency in Healthcare Delivery Systems	
	Chair(s): Seokjun Youn	

115-0363 Flow Control: The Opioid Network Context

Abhishek Ray, Assistant Professor, George Mason University, United States

John Biechele-Speziale, Student, Purdue University, United States

Monika Tomar, Student, Purdue University, United States

Mario Ventresca, Assistant Professor, Purdue University, United States

We consider the problem of setting optimal limits on flows and deciding on interventions for limit violations in a given network with weighted nodes and arcs. Our formulation considers a two stage Stochastic Optimization formulation, and has elements from the opioid network setting to motivate insights.

115-0461 Dynamic Interday and Intraday Scheduling

Christos Zacharias, Assistant Professor, University of Miami, United States

Nan Liu, Associate Professor, Boston College, United States

Mehmet Begen, Associate Professor, Ivey Business School, Western University, Canada

We develop a novel dynamic programming framework and associated theoretical results addressing the joint inter-day and intra-day appointment scheduling problem. Our model is designed with the intention of bridging two well-studied streams of literature and to leverage their latest theoretical developments in tackling the joint problem.

115-0500 Individualized Dynamic Patient Monitoring Under Alarm Fatigue

Hossein Piri, Assistant Professor, Haskayne School of Business, Canada

Woonghee Huh, Professor, Sauder School of Business, UBC, Canada

Steven Shechter, Associate Professor, Sauder School of Business, UBC, Canada

Darren Hudson, Professor, University of Alberta, Canada

Hospitals are rife with alarms, many of which are false. This leads to alarm fatigue, in which clinicians become desensitized and may inadvertently ignore real threats. We develop a partially observable Markov decision process (POMDP) model for recommending dynamic, patient-specific alarms, and analyze its performance using real clinical data .

115-0578 Patient Sensitivity to Emergency Department Waiting Time Announcement

Eric Park, Assistant Professor, The University of Hong Kong, Hong Kong, China

Huiyin Ouyang, Assistant Professor, The University of Hong Kong, China

Jingqi Wang, Assistant Professor, Chinese Univ of Hong Kong (Shenzhen), China

Sergei Savin, Professor, University of Pennsylvania, United States

Timothy Rainer, Professor, The University of Hong Kong, Hong Kong, China

We study how patients respond to delay announcement in ED networks where they can decide which to attend. Using 1.3 million patient visits to 17 public hospitals in Hong Kong's universal public healthcare system, we structurally estimate how many patients are sensitive to the delay announcements and their sensitivity.

115-1289 Spinoff from Health Information Exchanges

Saeede eftekhari, Assistant Professor, Tulane University, United States

Ram Ramesh, Professor, State University of New York, United States

Doctor shopping is a phenomenon where a patient chooses to visit multiple physicians with the same expertise. Patient need to contact their physicians for the medical data when they shop. In this study we investigate whether patients can potentially view Health Information Exchanges (HIE) as a gateway.

# Wednesday, 11:30 AM - 01:00 PM

## Invited Session

369

Wednesday, 11:30 AM - 01:00 PM, Celebration 6

Track: Healthcare Analytics

Invited Session: Empirical Operations Management in Healthcare

Chair(s): Umit Celik

115-0191 A Complexity-based Measure for Emergency Department Crowding

Enayon Taiwo, Assistant Professor, The University of Winnipeg, Canada

Farzad Zaerpour, Assistant Professor, The University of Winnipeg, Canada

Mozart Menezes, Professor, NEOMA Business School, France

Zhankun Sun, Assistant Professor, City University of Hong Kong, Hong Kong, China

We propose some complexity measures for ED service systems, taking into account important patient-level and system characteristics. Using an extensive data set from a Canadian ED, we demonstrate that the complexity measure is potentially more important than some well-known crowding metrics.

115-0786 Does Physician's Choice of When to Perform EHR Tasks Influence Total EHR Workload?

Umit Celik, Student, UNC Kenan-Flagler Business School, United States

Sandeep Rath, Assistant Professor, University of North Carolina Chapel Hill, United States

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

Bradley Staats, Professor, University of North Carolina Chapel Hill, United States

We investigate how physicians' workflow decisions on when to perform EHR tasks affect: (1) time spent after work and (2) total time on EHR. We empirically study the trade-offs in choosing when to work on EHR tasks. We find performing pre appointment EHR reduces the physician EHR.

115-1140 Impact of Telehealth on Appointment Adherence in Ambulatory Care

Masoud Kamalahmadi, Assistant Professor, Miami Herbert Business School, United States

Christos Zacharias, Assistant Professor, University of Miami, United States

Howard Gitlow, Professor, University of Miami, United States

We study the effect of telehealth on patients' adherence to medical appointments in ambulatory care. Using data from a large medical system, we find that telehealth improves appointment adherence. We discuss the implications of our findings for managers and policy makers.

115-1881 Can Employees' Past Helping Behavior be Used to Improve Shift Scheduling? Evidence from ICU Nurses

Zoey Jiang, Assistant Professor, Carnegie Mellon University, United States

John Silberholz, Assistant Professor, University of Michigan, United States

Yixin Iris Wang, Assistant Professor, University of Illinois Urbana-Champaign, United States

Deena Costa, Associate Professor, University of Michigan, United States

Michael Sjoding, Assistant Professor, University of Michigan, United States

We define two measures of past helping behavior for employees assigned to a shift, and use ICU nursing data to show that both predict and significantly reduced patient length of stay. Counterfactual analysis shows promise of scheduling pairs of employees who have previously helped each other to the same shift.

## Invited Session

370

Wednesday, 11:30 AM - 01:00 PM, Celebration 7

Track: Sustainable Operations Management

Invited Session: Sustainable and Socially Responsible OM

Chair(s): Jason Nguyen

115-0335 An Optimal Stationary Policy for Managing Residential Energy Storage

Na Rea Cho, Student, University of Alabama Tuscaloosa, United States

Youngsoo Kim, Assistant Professor, University of Alabama Tuscaloosa, United States

Karthik Murali, Assistant Professor, Oregon State University, United States

Mesut Yavuz, Associate Professor, University of Alabama Tuscaloosa, United States

We identify an optimal stationary battery management policy for a household with a paired solar array in the presence of time-of-use tariffs and sellback credits, and develop an efficient heuristic to characterize this policy. Our results indicate that our proposed policy can substantially increase the value of home energy storage.

115-0729 Applying Energy Surcharges to Increase Supply Chain Energy Efficiency: A Cautionary Tale

Jason Nguyen, Assistant Professor, Ivey Business School, Canada

Karen Donohue, Professor, University of Minnesota, United States

Mili Mehrotra, Associate Professor, University of Illinois, United States

Energy surcharges are often used to internalize energy externalities and encourage more Energy Efficiency (EE) investments. However, the higher energy price can cause loss of domestic manufacturing to external competitors. We establish conditions when an energy price surcharge is beneficial or detrimental to domestic manufacturing, EE investment and social welfare

115-0799 Impact assessment of large-scale community-level intervention to encourage adoption of sustainable practices

Subhankar Saha, Student, Indian Institute of Management Bangalore, India

## Wednesday, 11:30 AM - 01:00 PM

Haritha Saranga, Professor, Indian Institute of Management Bangalore, India  
Sriram Narayanan, Professor, Michigan State University, United States

The periodical crop residue burning over the Indo-Gangetic Plain in India causes excessive particulate matter emissions with severe repercussions for public health. This study assesses the impact of large-scale community-level intervention through the lens of sustainability to encourage farmers to adopt eco-friendly practices to prevent the detrimental practice of burning.

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115-1426 Diversion in Prescription Opioid Supply Chains: Evidence from the Drug Supply Chain Security Act

Jingwen Yang, Assistant Professor, University of Nevada Las Vegas, United States  
Anant Mishra, Associate Professor, University of Minnesota, United States

This study investigates the diversion of prescription opioids from drug supply chains. Utilizing the enactment of the Drug Supply Chain Security Act, we empirically examine whether and how supply chain diversion of prescription opioids fuels the ongoing epidemic. We further investigate the heterogeneous impacts of diversion across demographic groups.

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### Invited Session

371	Wednesday, 11:30 AM - 01:00 PM, Celebration 8	Track: Sustainable Operations Management
	Invited Session: Innovative Models for Environmental Sustainability	
	Chair(s): Greys Sosic Hailong Cui	

115-0257 Waste Management Hierarchy in Sustainable Operations

Dustin Cole, Assistant Professor, Auburn University, United States  
Wayne Fu, Assistant Professor, University of Michigan Dearborn, United States

This research aims to understand how waste management hierarchy influence firm environmental performance. Based on the hierarchy, we compare the impact of primary reduction, source reductions, and secondary reduction, waste reductions. We find primary reduction has a stronger impact, though this is not universal and depend on firm resource.

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115-0303 Planning Bike Lanes with Data: Ridership, Congestion, and Path Selection

Jingwei Zhang, Student, University of California Los Angeles, United States

We study the bike lane planning problem considering its conflicting effects in reducing and increasing traffic congestion. In an extensive case study in Chicago, we estimate adding 25 miles of prescribed bike lanes can lift cycling mode share from 3.9% to 6.9%, with at most an 8% increase in driving times.

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115-0567 Examining Sustainability as a Service Model in Retail

Huseyn Abdulla, Assistant Professor, University of Tennessee Knoxville, United States  
Seulchan Lee, Assistant Professor, Michigan Technological University, United States  
Han Oh, Assistant Professor, Tilburg University, Netherlands

In this research, we analytically examine a new business model in the context of an online retailer who has made a sustainability commitment to become carbon neutral and a Sustainability as a Service (SaaS) provider.

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115-0728 Inter-Firm Knowledge Sharing for Energy Efficiency

Jaeseok Lee, Lecturer, The University of Auckland, New Zealand  
Seongkyoon Jeong, Assistant Professor, University of Tennessee Knoxville, United States  
Hyun Ju Jung, Assistant Professor, KAIST, South Korea

We empirically investigate how firms that participate in a knowledge community for energy saving improve energy efficiency. Specifically, we examine whether and how knowledge-sharing firms improve energy efficiency more than free-riders. Overall, we provide implications on how firms can contribute to a collective response to climate change.

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### Invited Session

372	Wednesday, 11:30 AM - 01:00 PM, Celebration 9	Track: Supply Chain Management
	Invited Session: Recent Topics in Supply Chain Management	
	Chair(s): Ki Ling Cheung	

115-0261 Offline Pricing and Demand Learning with Censored Data

Jinzhi Bu, Assistant Professor, The Hong Kong Polytechnic University, Hong Kong, China  
David Simchi-Levi, Professor, Massachusetts Institute of Technology, United States  
Li Wang, Student, Massachusetts Institute of Technology, United States

We study a data-driven pricing problem with lost sales. The retailer faces an unknown demand function and has the objective of using censored data to set prices and maximize expected revenues within inventory limits. We characterize the condition for problem identifiability and propose a data-driven algorithm with sample complexity guarantees.

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115-0332 Selling Format and Seller Services in Online Retailing

Ki Ling Cheung, Associate Professor, Hong Kong University of Science and Technology, Hong Kong, China  
Albert Ha, Professor, Hong Kong University of Science and Technology, China  
JIANYUE WANG, Student, Hong Kong University of Science and Technology, Hong Kong, China

## Wednesday, 11:30 AM - 01:00 PM

We study the selling format and the strategies of seller services (advertising and information sharing) in a supply chain. We fully characterize the equilibrium and show how preference of the selling format depends on the model parameters. We show the impact of more seller services with two benchmark models.

115-1331 Fairness-concerned Supply Chain Design under Random Demand and Yield

Satender Singh, Assistant Professor, Jindal Global Business School, India  
Arnab Adhikari, Assistant Professor, Indian Institute of Management Ranchi, India  
Amit Sachan, Associate Professor, Indian Institute of Management Ranchi, India  
Arnab Bisi, Associate Professor, Johns Hopkins University Carey Business School, United States

We design a fairness-concerned dyadic supply chain comprising one manufacturer and one retailer under demand and supply uncertainties using wholesale price, buyback, option, revenue sharing, quantity discount, and sales rebate contracts, and devise coordination strategies. We propose a contract selection framework from the retailer's and manufacturer's perspectives.

115-1343 Managing Sales via Livestream Commerce: Implications of Price Negotiation and Consumer Price Search

Luyi Gui, Associate Professor, University of California Irvine, United States  
Xi Lin, Student, University of California Irvine, United States  
Yixin Lu, Associate Professor, George Washington University, United States

Livestream commerce has become an important sales channel with billions of revenue potential. We analyze the negotiation dynamics between the brand and the key opinion leader who promotes the product in a livestream sale. We also study how consumer search affects such dynamics and the profitability of this channel.

### Contributed Session

<b>373</b>	Wednesday, 11:30 AM - 01:00 PM, Celebration 10	Track: Supply Chain Management
	Contributed Session: <b>OM and Sustainability</b>	
	Chair(s): Steven Melnyk	

115-0415 Comparing Cellular Manufacturing Methods

Bugra Ilgaz Boyukkiri, Student, Southern Illinois University Edwardsville, United States  
Stanislaus Solomon, Professor, Southern Illinois University Edwardsville, United States  
Mitch Millstein, Professor, University of Missouri St Louis, United States

We simulate four methods of managing work flow in cellular manufacturing (one-piece flow, Conwip, drum-buffer-rope, and takt-time grouping) to determine their relative performance and sensitivity to: (1) imbalance in cycle times across cell operations, (2) variation in cycle times of cell operations, and (3) the duration of set-up times.

115-1572 Quantifying Supplier Burnout - The Development of Relevant Scales

Steven Melnyk, Professor, Michigan State University, United States  
William Ritchie, Associate Professor, James Madison University, United States  
Travis Tokar, Associate Professor, Texas Christian University, United States  
Tobias Schoenherr, Professor, Michigan State University, United States  
Zac Rogers, Assistant Professor, Colorado State University, United States

With the increasing importance of supplier initiated separation, focus is moving to the supplier and the quality of the supplier-buyer relationship. This presentations presents formative work on the development of four scales describing the quality of this relationship - supplier exhaustion, cynicism, exhaustion, and inefficacy.

115-1800 Supply base rationalization under manufacturing flexibility.

Nishant Verma, Assistant Professor, Indian Institute of Management Bangalore, India

We consider a firm that plans to invest in production flexibility in their manufacturing units. For such a firm, an important consideration is to plan its supply base to best suit its manufacturing flexibility configuration. Our study compares the impact of supply base under higher and lower manufacturing flexibility.

### Invited Session

<b>374</b>	Wednesday, 11:30 AM - 01:00 PM, Celebration 11	Track: Manufacturing Operations
	Invited Session: <b>Socially and Environmentally Responsible Manufacturing</b>	
	Chair(s): Gokce Esenduran      Burcu Tan Erciyes	

115-0295 Friend or Foe? How to Compete Against Unsustainable Knockoffs with Open-Source Strategy and Advertising

Fei Gao, Assistant Professor, Indiana University Bloomington, United States

We study the competition between a sustainable firm with proprietary technology and a knockoff competitor. In particular, we study two strategies that have been used by many sustainable firms to cope with the unsustainable knockoffs: (i) releasing the green technology as open source and (ii) launching an advertising campaign.

115-0347 Curbing emissions: environmental regulations and product offerings across markets

Zheng Han, Assistant Professor, Depaul University, United States  
Bin Hu, Associate Professor, Naveen Jindal School of Management, United States

## Wednesday, 11:30 AM - 01:00 PM

Milind Dawande, Professor, University of Texas Dallas, United States

The Trump administration's plan to freeze the EPA standard threatened to widen its gap from the CARB standard and cause a split market for automakers. We adopt a game-theoretic model considering two regulators and show that horizontal negotiations and vertical negotiations can both unify a split market.

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### 115-0504 Manufacturing as a Service

Burcu Tan Erciyas, Associate Professor, University of New Mexico, United States

Gokce Esenduran, Assistant Professor, Purdue University, United States

Alok Chaturvedi, Professor, Purdue University, United States

Gaurav Nanda, Assistant Professor, Purdue University, United States

We study a Manufacturing as a Service environment motivated by an initiative that brings mobile manufacturing environments (i.e., Factories on Wheels - FOWs-) to low-income communities (i.e., labor firms) so that these communities make/sell products and achieve economic growth. We model the interaction between a social planner, labor firms, and FOWs.

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### 115-1634 Increasing Manufacturing Flexibility Through Battery Management of Automated Guided Vehicles (AGVs): Effect of AGV Failure

Qazi Kabir, Assistant Professor, Rowan University, United States

Yoshinori Suzuki, Professor, Iowa State University, United States

Current literature outlines an approach of increasing manufacturing flexibility through battery management of automated guided vehicles (AGVs). However, it is not clear how the failure/breakdown of AGVs would impact such an approach to increase manufacturing flexibility. This research will fill-up that research gap.

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## Invited Session

<b>375</b>	Wednesday, 11:30 AM - 01:00 PM, Celebration 12	Track: Humanitarian Operations and Crisis Management
	Invited Session: <b>Decision Making in Presence of Supply Chain Disruptions</b>	
	Chair(s): Mohammad Arbabian      Hossein Rikhtehgar Berenji	

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### 115-0374 OPTIMAL INVENTORY POLICIES IN DISRUPTED SUPPLY CHAINS DURING PANDEMICS: AN APPLICATION TO DIAGNOSTIC TEST KITS

Hossein Rikhtehgar Berenji, Assistant Professor, Pacific University, United States

Mohammad Arbabian, Assistant Professor, University of Portland, United States

The COVID-19 pandemic has changed the normal life and business environments across the globe. Not long after starting large-scale testing, countries hit a roadblock-- the shortage of swabs used in the testing kits, which took place due to disruptions in the supply chain caused by COVID-19.

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### 115-0388 Supply Chain Game Theory Network Modeling Under Labor Constraints: Applications to the Covid-19 Pandem

Anna Nagurney, Professor, University of Massachusetts Amherst, United States

The Covid-19 pandemic has brought attention to supply chain networks due to disruptions including labor shortages. In this paper, we construct a supply chain game theory network framework that captures labor constraints under distinct scenarios with a case study on a food product. Theoretical and computational results are presented.

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### 115-0630 Vaccine network design to maximize immunization coverage

Jarrold Goentzel, Senior Lecturer, Massachusetts Institute of Technology, United States

Timothy Russell, Post Doc/Researcher, Massachusetts Institute of Technology, United States

Henrique Carretti, Student, MIT, United States

Yuto Hashimoto, Student, MIT, United States

We propose an optimization model with an endogenous demand function to maximize immunization access. The model was developed with UNICEF and validated with application in The Gambia. Results show that optimizing outreach site location and resource deployment could increase immunization coverage from 91.0 to 97.1% under the same budget.

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### 115-1886 Sustainable energy transition in humanitarian medical cold chains

Sonja Saari, Student, Hanken School of Economics, Finland

Diego Vega, Assistant Professor, HUMLOG Institute, Finland

Andreas Wieland, Associate Professor, Copenhagen Business School, Denmark

Arni Halldorsson, Professor, Chalmers Institute of Technology, Sweden

This research uses the panarchy theory to analyze the vaccination trial in South Sudan in 2023. Through an in-depth case study, we aim to understand the principles for resilience and sustainability thinking that influence the narrative of using sustainable energy in humanitarian cold chains.

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## Contributed Session

<b>376</b>	Wednesday, 11:30 AM - 01:00 PM, Celebration 13	Track: Humanitarian Operations and Crisis Management
	Contributed Session: <b>Logistics I</b>	
	Chair(s): Rafael Diaz	

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### 115-0689 Revisiting the definition of humanitarian logistics

JOAKIM KEMBRO, Associate Professor, Lund University, Sweden

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



## Wednesday, 11:30 AM - 01:00 PM

Lina Frennesson, Student, Lund University, Sweden

Diego Vega, Assistant Professor, HUMLOG Institute, Finland

Humanitarian logistics (HL) is a relatively new but increasingly important research area that relies on conceptual definitions from the early 2000s. We revisit and offer a revised definition of HL by combining the insights from a survey of academic research and an expert elicitation process over multiple rounds

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115-0886 Incorporating Nutrition and Acceptability Considerations in Food Aid Distribution

Trilce Encarnacion, Assistant Professor, University of Missouri St Louis, United States

Haitao Li, Assistant Professor, University of Missouri St Louis, United States

This paper presents an analytical formulation to configure the supply chain of humanitarian operations distributing food aid for long periods. The tactical decision making framework enables the evaluation of trade-offs between relevant metrics not considered by current approaches, such as acceptability and nutrition.

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115-1010 Measuring fairness perceptions based on Willingness-To-Accept in humanitarian logistics

Jianfang Shao, Post Doc/Researcher, University of Science and Technology of China, China

Yu Fan, Post Doc/Researcher, University of Science and Technology of China, China

Xihui Wang, Professor, School of Management, China

Inequity aversion is a widely adopted measurement of fairness perceptions. In this paper, we use Willingness-To-Accept to measure inequity aversion, which is defined as the economic compensation value obtained when facing inequitable allocation of goods/services. Deeper understanding of fairness perceptions can then be achieved to help decision-making in humanitarian logistics.

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115-1954 Modeling the Mobility and Coordination for Housing Recovery After a Catastrophic Event

Rafael Diaz, Associate Professor, Old Dominion University, United States

Joshua Behr, Associate Professor, Old Dominion University, United States

Katherine Smith, Assistant Professor, Old Dominion University, United States

Beatriz Acero, Affiliated Researcher, Old Dominion University, United States

Resource assignment for housing recovery after a natural disaster is complex as the decision space is extensive and intricate. We studied displaced vulnerable segments and developed an AI approach to assist in exploring the decision space to provide the best resource allocation and schedule while considering household vulnerabilities and constraints

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### Invited Session

377	Wednesday, 11:30 AM - 01:00 PM, Celebration 14	Track: Service Operations
	Invited Session: <b>Service Workforces</b>	
	Chair(s): Vincent Slaugh	

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115-0710 Implications of Worker Classification in On-Demand Economy

Ming Hu, Professor, University of Toronto, Canada

Zhoupeng (Jack) Zhang, Student, Rotman School of Management, Canada

Jianfu Wang, Associate Professor, City University of Hong Kong, Hong Kong, China

We study the policy question of how gig workers shall be classified, focusing on the welfare of full-timers, who depend on gig jobs as primary income sources. Reclassifying gig workers uniformly may hurt full-timers due to marketplace operator's undercutting or workers' overjoining. Flexible schemes can Pareto improve over uniform approaches.

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115-1669 Driving Win-Win Efficiencies for Outsourced Litigation and Other Complex Services

Jacob Chestnut, Assistant Professor, Cornell University, United States

Damian Beil, Professor, University of Michigan, United States

We consider the management of complex non-routine white-collar services. We develop an analytical model of the benefit of supplier process reengineering and explore how various aspects of the business setting differentially affect this benefit, leading to conflicting incentives. We show that both firms in the supply chain can benefit.

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115-1687 Adoption Platform Design to Improve Outcomes for Children with Disabilities

Ludwig Dierks, Post Doc/Researcher, University of Zurich, Switzerland

Vincent Slaugh, Assistant Professor, Cornell University, United States

Utku Unver, Professor, Boston College, United States

We model a child adoption matching platform in which families state their capability to care for a child with high special needs. We analytically derive the optimal child-matching mechanism that incentivizes families to truthfully represent their capabilities and provide managerial insights to inform how to recruit and coach families.

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115-1785 Hiring Preference and Operational Complexity for Tribal Enterprises

Jacob Ornelas, Student, Cornell University, United States

Vincent Slaugh, Assistant Professor, Cornell University, United States

Chris Anderson, Associate Professor, Cornell University, United States

We describe how workforce composition goals interact with operational challenges for Native American enterprises. Based on interviews with tribal casino executives, we focus on both tactical and strategic workforce challenges, some of which arise in unique ways for tribal enterprises and others that reflect broader service industry trends.

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## Wednesday, 11:30 AM - 01:00 PM

### Invited Session

<b>378</b>	Wednesday, 11:30 AM - 01:00 PM, Celebration 15	Track: Information Systems and Operations Management
	Invited Session: <b>Manufacturers' platform-based innovative operations and large-scale optimization</b>	
	Chair(s): Jun Pei      Wenjuan Fan	

115-1171 Optimal Content-sharing Strategy for Online Streaming Platforms

Eunsol Yoo, Student, Korea University, South Korea  
Kihoon Kim, Professor, Korea University, South Korea

Many subscription-based video-on-demand (SVoD) platforms are currently focusing on creating exclusive content to attract more subscribers. This research models two competing platforms' choices between leasing and not leasing exclusive content investigating the impact of their choices on the SVoD market size and the competition results.

115-1917 A Platform's Dilemma in Controlling Marketplace Transactions

Sumanta Singha, Assistant Professor, Texas Tech University, United States  
Rajib Saha, Associate Professor, Indian School of Business, India  
Abhijeet Ghoshal, Associate Professor, UIUC, United States

We study an online platform with network effects, where buyers impose a negative externality on other buyers. The platform can minimize this negative externality by applying control or pricing as a lever. Using a game-theoretic model, we characterize the market and present several interesting results about the platform's strategy.

115-2002 Joint decisions on capacitated lot-sizing and supplier selection under the effects of delivery time quotation

Fangjun Zhu, Student, Hefei University of Technology, China  
Jun Pei, Professor, Hefei University of Technology, China  
Ya Zhou, Student, Hefei University of Technology, China

This paper investigates a manufacturer's joint decisions on capacitated lot-sizing and supplier selection with the objective to minimize the cost, the joint decisions consist of three decisions: production decision, replenishment decision, and supplier selection decision. Particularly, the delivery time quotation is considered.

115-2004 When Platform Exploits Data Analysis Advantage: Change of OEM-led Supply Chain Structure

Ping Yan, Student, Hefei University of Technology, China  
Jun Pei, Professor, Hefei University of Technology, China  
Ya Zhou, Student, Hefei University of Technology, China

The development of digital technology has enabled e-commerce platforms to use the data generated in their ecosystems, helping firms forecast the online demand more accurately. This study considers a two-echelon supply chain and investigates the relations between the forecast information and firms' channel strategies.

### Invited Session

<b>379</b>	Wednesday, 11:30 AM - 01:00 PM, Coral Spring 1	Track: Emerging Topics in Operations Management
	Invited Session: <b>Emerging Topics in Operations Management XIV</b>	
	Chair(s): Fan Zou      Zhihao Zhang	

115-0647 Examining the Mechanism of Financing a Push or Pull Supply Chain

Xiaofeng Xie, Associate Professor, Sichuan University, China  
Xun Xu, Associate Professor, California State University Dominguez Hills, United States  
Zixuan Zhou, Student, Sichuan University, China  
Jing Gu, Professor, Sichuan University, China

Participants may have the capital constraint to prevent their normal operations in a push or pull supply chain. Financing mechanisms can be different given the different operations of a push or pull supply chain, which are examined in this study. We provide managerial insights to improve supply chain performance.

115-1690 Proposal of a Knowledge-Based Expert System for Risk Management in Health Audit Projects

Eduyn López, Assistant Professor, Universidad Distrital Francisco José de, Colombia  
Camilo Bustos, Student, Universidad Distrital Francisco José de, Colombia

We present a knowledge-based expert system for risk assessment in health audit projects. We use a fuzzy group decision making approach (FGDMA) to qualify a predetermined list of risks through linguistic terms that are then converted into numerical values. We present some results from a data set in Colombia

115-1863 Helping Vulnerable Hospitals

Meng Li, Associate Professor, University of Houston, United States  
Qiang Li, Assistant Professor, Wilfrid Laurier University, Canada  
Wei Gu, Associate Professor, University of Science and Technology Beijing, China

Due to the uneven distribution of healthcare resources, hospitals in developing countries often struggle to provide essential medical services and supplies evenly throughout their communities. We take advantage of an exogenous event of the introduction of outside experts to examine the impact of the program on service efficiency and quality.

## Wednesday, 11:30 AM - 01:00 PM

### Invited Session

<b>381</b>	Wednesday, 11:30 AM - 01:00 PM, Blue Spring 1	Track: Supply Chain Risk Management
	Invited Session: Emerging Disruptive Technologies in Omni-Channel Supply Chains	
	Chair(s): Ahmet Colak	

115-0125 Do Global Political Uncertainty Influence Online Reviews? "Evidence from Amazon Global Review Sharing"

Maneesh Reddy Ajjuguttu, Student, Clemson University, United States  
Ahmet Colak, Assistant Professor, Clemson University, United States  
Lawrence Fredendall, Professor, Clemson University, United States

Since 2020 Amazon has followed an innovative strategy to share global reviews. Under this strategy, Amazon posts reviews from Amazon's international markets on Amazon.com. In this research, we study the effects of review-sharing on Amazon's domestic market in the USA under the influence of economic policy uncertainty.

115-0981 The hidden cost of coordination: Customers' role in last-mile delivery

Natalie Epstein, Student, HBS, United States  
Santiago Gallino, Assistant Professor, The Wharton School, United States  
Antonio Moreno, Associate Professor, Harvard University, United States

Communication between service providers and customers is key for service operations. We partner with a last-mile delivery company to study the impact the communication channel used to inform customers their order is out-for-delivery. We conduct field experiments to study the impact on failed deliveries.

115-1098 The Impacts of Algorithmic Work Assignment on Fairness Perceptions and Productivity: Evidence from Field Experiments

Bing Bai, Student, Washington University in St. Louis, United States  
Hengchen Dai, Assistant Professor, University of California Los Angeles, United States  
Dennis Zhang, Associate Professor, Washington University in St. Louis, United States  
Fuqiang Zhang, Professor, Washington University St Louis, United States  
Haoyuan Hu, Technical Specialist, Alibaba Group, China

We study how algorithmic (vs. human-based) task assignment processes change workers' fairness perceptions and productivity. In two field experiments with Alibaba where warehouse picking workers received tasks either from an algorithm or a human, the algorithmic assignment process was perceived as fairer and yielded productivity gains.

115-1419 Understanding Features in New and Used Products: Evidence from Automotive Industry

Hojun Choi, Student, Northwestern University, United States  
Ahmet Colak, Assistant Professor, Clemson University, United States  
Sina Golara, Assistant Professor, Kennesaw State University, United States  
Achal Bassamboo, Professor, Northwestern University, United States

Features on durable goods have evolved due to OEMs and vendors' constant efforts to improve their products to match consumers' changing preferences. Yet, the effects of features are under-explored, particularly on new and used products. Using large automotive industry datasets, we study features' collective impacts on pricing and sales performance.

### Invited Session

<b>382</b>	Wednesday, 11:30 AM - 01:00 PM, Blue Spring 2	Track: Supply Chain Risk Management
	Invited Session: Supply Chain Management with Emerging Risks	
	Chair(s): Rong Li Xiaole Wu	

115-0030 Multi-Period Supply Chain Coordination in Franchise Networks: The Necessity of Trading Platform

Rong Li, Associate Professor, Syracuse University, United States  
Liangbin Yang, Assistant Professor, Syracuse University, United States  
Xiaohang Yue, Associate Professor, University of Wisconsin - Milwaukee, United States

We study how to achieve channel coordination in a multi-period setting with the help of inventory platforms that allow inventory trading within a franchise network. We show that coordination requires the franchisor to use inventory trading and serve as the market maker, profit only from royalties, and not compensate shipping.

115-0076 Reshoring under Tariff Uncertainties and Competition

Xiao Tan, Student, Washington University in St. Louis, United States  
Panos Kouvelis, Professor, Washington University in St. Louis, United States  
Sammi Tang, Associate Professor, University of Miami, United States

Recent developments in U.S. tariff policies prompt companies to rethink the need for a diversified global supply chain, particularly by adding an onshore production location to the current offshore location. We adopt Newsvendor Network framework to analyze the global firm's reshoring capacity decisions with competition and demand and tariff uncertainties.

115-0759 Financial Hedging and Operational Flexibility

Qi Wu, Assistant Professor, Case Western Reserve University, United States  
Peter Ritchken, Professor, Carnegie Mellon University, United States

## Wednesday, 11:30 AM - 01:00 PM

Firms that lack operational flexibility find it costly to alter production volume. Such firms may have greater need to hedge against volatile prices so as to reduce the probability of costly lower tail outcomes. Our paper is concerned with how technological flexibility jointly impacts capital structure and financial hedging decisions.

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### Invited Session

<b>383</b>	Wednesday, 11:30 AM - 01:00 PM, Rainbow Spring 1	Track: Empirical Research in Operations Management
	Invited Session: Empirical Research in Different Application Areas of Operations Management	
	Chair(s): Saurabh Ambulkar	

115-0514 The Impacts of In-App Baggage Tracking on Airline Baggage-Handling Performance

Zenan Zhou, Assistant Professor, Arizona State University, United States  
Xiang Wan, Associate Professor, Ohio State University, United States  
Hongshuang (Alice) Li, Associate Professor, The Ohio State University, United States  
A. Knemeyer, Professor, Ohio State University, United States

Major airlines have improved their mobile applications (apps) by providing passengers with a real-time baggage tracking function. This study explores the impacts of the implementing airlines' introduction of in-app baggage tracking on their baggage-handling performance and that of the non-implementing airlines.

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115-1103 Do Competitor Promotions Cause Spillover Effects across Platforms? Evidence from Video Games

Campbell Clarkson, Student, University of South Carolina, United States

Spillover effects have been studied extensively, but the extent of these effects for digital goods across online platforms is not entirely clear. In this paper, we empirically examine the implications of promoting video games on the user traffic for those same games on a different platform.

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115-1196 An empirical investigation of the effects of the US airport network on departure delays

Saeyoung Yoon, Student, KUBS(Korea University Business School), South Korea  
Hyun Seok (Huck) Lee, Associate Professor, KUBS(Korea University Business School), South Korea

Using eight years of archival data for all US flights of all airlines among all airports, obtained from Bureau of Transportation Statistics, we empirically investigate the relationship between network metrics and airline departure delays in the US airport network.

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115-1853 The Impact of Telemedicine on Mental Healthcare Service Usage and Quality: An Empirical Investigation

Yi Tang, Student, University of Minnesota, United States

Telemedicine is becoming increasingly popular for mental healthcare delivery especially during the COVID-19 pandemic. In this study, we find empirical evidence that enhancing affordability of and access to telemedicine increases patients' overall usage of mental health services, which ultimately improves mental healthcare quality.

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### Contributed Session

<b>384</b>	Wednesday, 11:30 AM - 01:00 PM, Rainbow Spring 2	Track: Operational Excellence
	Contributed Session: Panel: Industry and Academic Collaboration on Lean	
	Chair(s): Eric Olsen	

115-1774 Win-Win Scenarios for Industry and Academia Collaboration in Research

Eric Olsen, Professor, California Polytechnic State University - San Luis Obispo, United States

Facilitated discussion to identify best practices and approaches for industry and academia to collaborate on significant research to move the field of operational excellence forward. Presenting and building on results of discussions with industry and academic professionals started at the 2023 Lean Summit hosted by the Lean Enterprise Institute.

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115-1783 Bringing Gemba into the Classroom - Industry and Academic Collaboration in Teaching

Eric Olsen, Professor, California Polytechnic State University - San Luis Obispo, United States

Facilitated, interactive discussion to identify best practices and approaches for bringing relevant industry practice and experience into university courses. Presenting and building on results of discussions with industry and academic professionals started at the 2023 Lean Summit hosted by the Lean Enterprise Institute.

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### Invited Session

<b>385</b>	Wednesday, 11:30 AM - 01:00 PM, Barrel Spring 1	Track: POM-Marketing Interface
	Invited Session: Sharing Economy	
	Chair(s): Tao Li	

115-0160 Competition between P2P Ridesharing Platforms and Traditional Taxis

Wen Diao, Assistant Professor, Shandong University of Finance&Economics, China  
Baojun Jiang, Professor, Washington University St Louis, United States  
Lin Tian, Associate Professor, Fudan University, China

## Wednesday, 11:30 AM - 01:00 PM

This paper analytically examines a market with two segments of consumers based on their travel distances, where a p2p platform and a traditional taxi company have different inconvenience costs and compete for customers through pricing.

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### 115-0773 Product Sharing: A Threat or an Opportunity for Competing Manufacturers?

Dali Huang, Student, Tianjin University, China  
Tao Li, Associate Professor, Santa Clara University, United States  
Zhen He, Professor, Tianjin University, China

This paper studies the impact of product sharing on competing manufacturers under a platform's different quality entry barrier strategies. Our paper provides the first study on how to cope with the sharing phenomenon for competing manufacturers, sharing platforms and consumers. The results present several managerially interesting and important insights.

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### 115-0913 Fixed commission in on-demand matching

Ming Hu, Professor, University of Toronto, Canada  
Yun Zhou, Associate Professor, McMaster University, Canada

We consider a on-demand service platform that relies on independent contractors to provide service. The platform sets both the service price and commission. We bound the performance of a fixed commission across heterogenous market conditions and discuss factors that drive the performance.

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### 115-1521 Exploring restaurant's and food delivery platform's online pricing strategies

Yong Xia, Student, University of California San Diego, United States  
Zhe Zhang, Assistant Professor, University of California San Diego, United States

Different from other online-offline retails, restaurants establishing the online channels have flexible online pricing and share the revenue with third-party platforms. Additionally, restaurants face potential risks of food quality reduction during the delivery process. This paper develops a model to examine how these online settings affect restaurant's online pricing strategies.

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## Invited Session

<b>386</b>	Wednesday, 11:30 AM - 01:00 PM, Barrel Spring 2	Track: Procurement and Supplier Management
	Invited Session: Procurement Strategies	
	Chair(s): Kai Wendt	

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### 115-0205 Unlocking Barriers to Inclusive Procurement - ISM & MICMAC Approach

Asad Ali Qazi, Student, University of Rome - Tor Vergata, Italy  
Andrea Appolloni, Associate Professor, University of Rome - Tor Vergata, Italy

Study aims to investigate the barriers to adopt inclusive procurement. Diverging from previous research focused on developing a broad understanding of socially responsible purchasing. The paper identifies the barriers through literature review and further examines the interdependencies and influence among barriers through Delphi Method.

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### 115-0488 Algorithm Reliance for Binary Classification: Implications for Fairness

Clare Snyder, Student, University of Michigan Ann Arbor, United States  
Samantha Keppler, Assistant Professor, University of Michigan Ann Arbor, United States  
Stephen Leider, Professor, University of Michigan Ann Arbor, United States

Algorithms play a major role in binary classification decisions such as hiring, denying bail, and awarding loans, often as support for human decision-makers who might ultimately deviate from the algorithm's advice. How do behavioral biases affect algorithm reliance in these cases, and what implications does this have for decision fairness?

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### 115-0820 E-commerce Platform's Information Sharing and Selling Contract Choice with Supplier's Offline Showroom Investment

Jiahao Yu, Student, Renmin University of China, China  
Jianghua Wu, Professor, Renmin University of China, China

In this study, we study the platform's information sharing and selling contract choice when the supplier can invest in showroom to boost its sales in both online and offline channels. We find that the supplier will strategically adjust his investment level in offline showroom when its selling contract varies.

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### 115-1327 Payment Algorithm Transparency on On-Demand Service Platforms

Swanand Kulkarni, Student, Georgia Institute of Technology, United States  
Basak Kalkanci, Associate Professor, Georgia Institute of Technology, United States  
Chris Parker, Associate Professor, American University, United States

Motivated by service platforms' move towards less-intuitive and opaque algorithms that determine workers' compensation, through incentivized experiments, we examine how a pay algorithm's intuitiveness to workers, its transparency, and a change that reduces algorithm's intuitiveness affect workers' engagement and perceptions. Results reveal the effectiveness of transparency in managing workers' experience.

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### 115-2161 Behavioral Simulation of Blockchain-enabled Market for Supplier Capacity Trading among Retailers

Kai Wendt, Student, WHU - Otto Beisheim School of Management, Germany  
Daniel Hellwig, Student, WHU - Otto Beisheim School of Management, Germany

## Wednesday, 11:30 AM - 01:00 PM

We study markets for trading supplier capacity among retailers facing random demands and varying goods valuations. Retailers buy claims on supplier's capacity before knowing their demand and trade them after demand realization. Two novel trading strategies emerge. Players, whom we call spot sellers, buy more claims than the maximum demand initially and sell excess to the market. Other players, whom we call spot buyers, buy few claims from the supplier, using the market instead. These strategies reinforce each other, reduce a player's demand risk, and contribute to the reduction of mismatch between supply and demand. In small markets, clearing prices are correlated with the product values and the net demand. But in large markets, clearing prices are anchored to the capacity reservation price and do not reflect either product values or the net demand.

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### Invited Session

<b>387</b>	Wednesday, 11:30 AM - 01:00 PM, Rock Spring	Track: POM-Economics Interface
	Invited Session: POM-Economics Interface Applications	
	Chair(s): Xin Fang      Zhaowei She	

115-0272 Constructing Quantiles via Forecast Errors: Theory and Empirical Evidence

Zhi Chen, Assistant Professor, National University of Singapore, Singapore

Long Zhao, Assistant Professor, NATIONAL UNIVERSITY OF SINGAPORE, Singapore

Probabilistic forecasts (e.g., quantiles) are essential for decision-making under uncertainty. One simple approach of constructing quantiles leverages historical forecast errors. The sample quantile and normal approximation are two popular estimators. To understand their relative efficacies, we develop a theoretical framework using bias-variance decomposition and empirically test our theories.

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115-1078 Traceability and Product Recalls in a Vertically-Integrated Food Supply Chain

Beyza Celik, Student, University of Texas at Dallas, United States

Milind Dawande, Professor, University of Texas Dallas, United States

Ganesh Janakiraman, Professor, University of Texas Dallas, United States

Traceability can help reduce the cost of food recalls. However, it does not eliminate the probability of food safety crises. By considering the optimal traceability level and the contamination mitigation efforts of a vertically-integrated firm, we examine the impact of traceability on the interaction between a firm and its consumers.

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115-1575 Inventory Disclosure with Product Returns

Tolga Aydinliyim, Associate Professor, Zicklin School of Business, United States

Ceren Gultekin, Student, Zicklin School of Business, United States

We study whether selective-inventory-disclosure, which can mitigate the adverse profit implications of consumers' strategic purchase deferrals, remains effective when product returns are allowed. Using a price- and refund-setting newsvendor framework with availability-dependent demand, we show consistent-inventory-disclosure to be optimal. Furthermore, equilibrium refund relative to consistent-inventory-masking can be higher or lower.

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### Invited Session

<b>389</b>	Wednesday, 11:30 AM - 01:00 PM, Regency Ballroom O	Track: Retail Operations
	Invited Session: New topics in retail operations	
	Chair(s): Xin Liu	

115-0397 Sales contests with minimum sales volume requirement: Models and analysis

Zhen Shao, Student, University of Science and Technology of China, United States

Yangyang Xie, Assistant Professor, University of Science and Technology of China, China

Wenjuan Li, Student, Hong Kong University of Science and Technology, China

Qinglong Gou, Associate Professor, University of Science and Technology of China, China

This paper proposes a modified winner-take-all sales contest which requires a minimum sales volume, and addresses two primary questions: (i) how salespersons' effort-spending behavior will be affected by this minimum requirement, and (ii) whether and under which conditions a firm should adopt the minimum sales requirement.

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115-0761 Trade-in Strategy for Manufacturers Considering Government Subsidy and Marketing Effort

Xiaoya Han, Lecturer, University of Shanghai Science and Technology, China

Xin Liu, Assistant Professor, Elon University, United States

To explore how manufacturers should implement trade-in programs, whether to delegate trade-ins to retailers and whether to invest in marketing effort, we construct a closed-loop supply chain dominated by a manufacturer. This paper focuses on trade old for cash and trade old for new by considering government subsidy.

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115-0882 The Value of 'Buy-Online-Pickup-in-Store' for Retailers to Manage Online Fulfillment

Lina Zhang, Lecturer, University of Exeter, United Kingdom

Alexander Hübner, Professor, Technical University of Munich, Germany

Livio Fenga, Senior Lecturer, University of Exeter, United Kingdom

This research focuses chiefly on the impact of offering 'Buy-Online-Pickup-in-Store (BOPS)' in addition to home delivery to online consumers on a retailer's demand and profit. Specifically, we investigate how the retailer can design the delivery/collection options with different speeds and fees to steer consumers' fulfillment demand for increased profitability.

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115-0999 A risk-sharing mechanism for the insurance of multi-region catastrophe considering government subsidies

Mengzhe Zhou, Student, School of Management, China

## Wednesday, 11:30 AM - 01:00 PM

Xihui Wang, Professor, School of Management, China

In this study, we introduce a risk-sharing mechanism which determines region contributions to the total premium by accounting for disaster risks as well as the economic status of the regions. Superior government's subsidies are introduced when considering region's economic affordability. The proposed insurance scheme's performance is analyzed in practice.

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### Invited Session

390	Wednesday, 11:30 AM - 01:00 PM, Regency Ballroom P	Track: Disruptive Technologies and Operations Management
	Invited Session: IS/OM Interface	
	Chair(s): Yeongin Kim	

115-0756 Does tolerance for failure matter for innovation?

Zhijian Cui, Professor, University of Science and Technology of China, China

We examine TFF's relationship with the firms' R&D investment and innovation performance. Our results reveal the dual roles TFF plays in a firm's innovation. TFF culture positively relates to a firm's R&D investment as well as its innovation quality. It negatively relates to innovation quantity.

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115-0817 Online Crowdfunding in Humanitarian Operations and Crisis Management

Zhiyi Wang, Assistant Professor, University of Colorado Boulder, United States

Lusi Yang, Assistant Professor, Georgia State University, United States

Varun Karamshetty, Assistant Professor, National University of Singapore, Singapore

Jungpil Hahn, Professor, National University of Singapore, Singapore

The OM literature has been silent about whether crowdfunding can be used as an effective channel for HOCM fundraising, given that lenders in crowdfunding are characterized by both prosocial and risk considerations. We examine the interplay between prosocial motivations and risk considerations of crowd lenders during a crisis.

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115-1757 Do Workers and Customers Benefit from Competition Between On-demand Service Platforms?

Saif Benjaafar, Professor, University of Minnesota, United States

Shihong Xiao, Assistant Professor, Fudan University, China

Xiaotang Yang, Student, University of Minnesota, United States

We describe a game-theoretical model to study the effect of competition between on-demand service platforms. The platforms compete for workers and customers by deciding on wages to pay workers and prices to charge customers. We show that competition does not necessarily lead to higher worker welfare and higher consumer.

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115-1792 Effects of Human Intervention on the Efficacy of CNN-Driven Recommender Systems in Online Fashion Retail

Heeseung Lee, Assistant Professor, University of Texas at Dallas, United States

This study investigates the economic performance of two variants of image-based recommender systems that are developed on the basis of deep learning-driven convolutional neural networks (CNNs) in the context of fashion retailing.

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### Contributed Session

391	Wednesday, 11:30 AM - 01:00 PM, Silver Spring 1	Track: Data Science and Analytics
	Contributed Session: Analytics for Managing Supply and Demand	
	Chair(s): Michelle Rodriguez	

115-1619 Observatory of Urban Cargo Transportation of Metropolitan Lima

Claudio Ortega, Reader, Universidad del Pacifico, Peru

Michelle Rodriguez, Professor, Universidad del Pacifico, Brazil

Andres Regal, Student, Universidad del Pacifico, Peru

The Observatory of Urban Cargo Transportation of Metropolitan Lima was generated to systematically collect and permanently store data from the urban cargo transportation system in Metropolitan Lima. We present the implementation process, insights, and challenges from working with a private company with a 652-vehicle fleet and 18 months of data.

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115-1794 Vaccine Demand Forecasting

Abhijeet Kumar, Student, University of North Texas, United States

Victor Prybutok, Professor, University of North Texas, United States

Vikas Sangana, Student, University of North Texas, United States

The effectiveness of conventional demand planning strategies has been undermined by the complexity of the supply chain and the changing customer behaviour. In this study we are using ML technique to accurately predict the demand.

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115-1846 State of the Arts: Understanding Infrastructure Bias Using Location Analytics Add to Itinerary

Karthik Kannan, Assistant Professor, Southern Methodist University, United States

Sridhar Narasimhan, Professor, Georgia Institute of Technology, United States

Infrastructure bias emerges when the location of existing nonprofit arts and cultural organizations favors some communities while disadvantaging others from having equitable access to artistic and socio-cultural engagement. We develop methods to reduce this bias.

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## Wednesday, 11:30 AM - 01:00 PM

115-1851 Managing Supply and Demand for the Non-profit Performing Arts Organizations in the Time of COVID

Karthik Kannan, Assistant Professor, Southern Methodist University, United States

We develop a data-driven framework and decision support tool to explain and predict demand for live, in-person arts performances in the time of COVID. We use proprietary ticketing data from more than 100 performing arts organization, mobility data, to examine how the market for arts has changed after COVID-19.

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### Contributed Session

392	Wednesday, 11:30 AM - 01:00 PM, Silver Spring 2	Track: Inventory and Logistics Management
	Contributed Session: Multi-Echelon Inventory Systems	
	Chair(s): Sabitha Devarajulu	

115-0627 Multi-Echelon Distribution Network Design

Li-Lian Gao, Associate Professor, Hofstra University, United States

Powell Robinson, Professor, University of Houston, United States

Funda Sahin, Associate Professor, University of Houston, United States

The growth of e-commerce presents challenges to distribution network design. We consider a multi-echelon distribution network that could consist of central distribution centers, order fulfillment centers, cross-docking, and stores. The number, location, and allocation of demand to facilities are to be determined. We present an MIP formulation and computational experience.

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115-0792 Online Learning for Serial Multi-echelon Inventory Systems

Yufei Zhao, Student, The Chinese University of Hong Kong, Hong Kong, China

Zhanyue Wang, Student, The Chinese University of Hong Kong, China

Xiangyu Gao, Assistant Professor, The Chinese University of Hong Kong, Hong Kong, China

We consider a classical serial multi-echelon inventory system under the online learning setting, where the decision-maker does not know the demand distribution but learns as the data comes in. We apply the sample average approximation (SAA) method to the online learning algorithm and show a square root convergence rate.

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115-1689 Optimal Production and Inventory Control of a Supply Chain with Process Flexibility

Huasheng Yang, Post Doc/Researcher, Tsinghua University, China

David Kaufman, Assistant Professor, University of Michigan-Dearborn, United States

Wanshan Zhu, Professor, Renmin University of China, China

Li Zheng, Professor, Tsinghua University Department of IE, China

We consider a multi-stage make-to-order supply chain with process flexibility for multiple products. We study the dynamic production and inventory control problem and the associated process flexibility design problem. Despite the curse of dimensionality, we show that the problem is partially decomposable, reducing to lower-dimensional subproblems.

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### Invited Session

393	Wednesday, 11:30 AM - 01:00 PM, Winter Park 49	Track: Product Innovation and Technology Management
	Invited Session: Blockchain and Cryptocurrencies	
	Chair(s): Rowena Gan	

115-0428 Split or Steal? Sabotage and Reciprocity in Cryptocurrency Mining Pools

John Biechele-Speziale, Student, Purdue University, United States

Abhishek Ray, Assistant Professor, George Mason University, United States

Mario Ventresca, Assistant Professor, Purdue University, United States

Using both game theory and agent-based simulation, we examine how cryptocurrency mining pools, through asymmetric retaliation to sabotage attempts, can achieve better outcomes than prior work suggests. Additionally, we examine how environmental and internal parameters impact purely rational attack dynamics, and the limitations of common contracts to completely disincentivize sabotage.

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115-0870 The Effect of Ethereum's Gas Price Mechanism on the Heterogeneity of Platform Complements

Daniel Obermeier, Post Doc/Researcher, New York University, United States

Hanna Halaburda, Associate Professor, New York University, United States

Blockchain technology disintermediates digital platforms by substituting the platform provider's ability to set prices for transacting on a platform with a market mechanism. We use a sample of 1,590 decentralized applications on Ethereum to investigate how this constraint on a platform provider's strategic toolkit affects the platform's innovation capability.

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### Invited Session

394	Wednesday, 11:30 AM - 01:00 PM, Winter Park 50	Track: Socially Responsible Operations
	Invited Session: Emerging Topics in Socially Responsible Operations	
	Chair(s): Suvrat Dhanorkar Mateus do Rego Ferreira Lima	

115-0556 Mitigating Trade-offs between Safety and Completion Time: Public Relative Performance Feedback and Best Practice Sharing



## Wednesday, 11:30 AM - 01:00 PM

Soh Hyun Chu, Student, Ohio State University, United States

Elliot Bendoly, Professor, Ohio State University, United States

James Hill, Associate Professor, Ohio State University, United States

Implementing a time and motion laboratory experiment, we observe the effects of controlled conditions on completion time and safety. Treatments include feedback format, the existence of potentially conflicting feedback, and shared best practice training. We find conditions that help promote safe worker behavior even in the presence of time-specific priorities.

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115-0730 Do Recycling Standards Create or Destroy Value? Evidence From the National Sword Policy

Christian Blanco, Assistant Professor, Ohio State University, United States

Mateus do Rego Ferreira Lima, Student, The Ohio State University, United States

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

We built a fixed-effects panel regression model using five years of product daily prices (2016-2020) to investigate 1) the effects of the Chinese Sword Policy on the price of waste products in the United States, and 2) what interventions were effective in mitigating the effects of the Sword.

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## Contributed Session

<b>397</b>	Wednesday, 02:45 PM - 04:15 PM, Celebration 1	Track: Agriculture and Food Supply Chains
	Contributed Session: Financing Issues in Agriculture	
	Chair(s): Kalinga Jagoda	

115-0037 Financing Models for Marginal Farmers to ensure Quality in Agricultural Supply Chain

Samir Biswas, Student, Indian Institute of Management Calcutta, India  
 Preetam Basu, Senior Lecturer, Kent Business School, United Kingdom  
 Balram Avittathur, Professor, Indian Institute of Management Calcutta, India

Lack of financial resources hinders smallholder farmers from producing high-quality agricultural products. Recently, online platforms have come up with novel financing schemes for these marginal farmers. Using a game-theoretic model, we explore the effectiveness of different financing schemes, viz. bank, guarantor and platform financing in improving agricultural product quality.

115-0571 Government subsidy policy in the agricultural supply chain considering yield uncertainty

Zhaofang Mao, Professor, Tianjin University, China  
 Zhengbo Liang, Student, Tianjin University, China

The equilibria with and without the government subsidy policy in a three-tier agricultural supply chain are investigated. Besides the condition without the government subsidy policy, two scenarios that the government provides a cost subsidy to the farmers and the government provides purchasing subsidy to one of the retailers are studied.

115-1154 Gaps in Cotton Supply Chain Financing among Cash-constrained Farmers in Benin: The Case of Kambara

Rachad Bani Samari, Student, American University In Cairo, Benin  
 Sherwat Ibrahim, Associate Professor, Princeton University, Egypt

Benin almost tripled its cotton output within three years, however, contrary to literature, monetary poverty is on the rise in the top three cotton producing departments. Our study reveals a misalignment between Agriculture Supply Chain Financing and farmers needs and goals created a vicious circle of monetary poverty among smallholders.

115-2021 Optimizing Value Creation and Capture through Supply Chain Mapping

Kalinga Jagoda, Associate Professor, University of Guelph, Canada  
 Senevi Kiridena, Senior Lecturer, University of Wollongong Australia, Australia

With changing population demographics specialty crops present significant opportunities for agri-businesses to develop niche markets or integrate into established supply chains. This paper map hazelnut supply chain, using a suite of tested methodological approaches to evaluate their market potential, considering total supply chain costs, lead times and responsiveness.

## Invited Session

<b>398</b>	Wednesday, 02:45 PM - 04:15 PM, Celebration 2	Track: Energy and Natural Resource Management
	Invited Session: Energy Transitions	
	Chair(s): Fariba Farajbakhsh Mamaghani Metin Cakanyildirim	

115-0279 Open BIM integration into Oil and Gas supply chain

Daniel Luiz Nascimento, Professor, CERTI, Brazil  
 Flavio Magno, Project Manager, CERTI, Brazil  
 Alessandra Roeder, Project Manager, CERTI, Brazil  
 Diego Calvetti, Post Doc/Researcher, CERTI, Portugal  
 Guilherme Tortorella Tortorella, Associate Professor, University of Melbourne, Australia

This work aims to improve the process of requesting, designing, supplying and building/installing flexible pipelines for the extraction of oil and gas. We conducted an analysis of the current process and designed a future proposal where Open BIM could be incorporated. Results suggest that suppliers collaboration increased given the digitalization.

115-1497 The Impact of Supply Intermittency on Optimal Timing and Capacity of Renewable Energy Investments

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

We address optimal timing and capacity of consumers' investment in renewable energy under supply intermittency, net metering, and stochastically evolving demand. Supply intermittency is shown to delay that investment, while net metering speeds it up. In contrast to existing results, incorporating supply intermittency does not necessarily reduce the optimal capacity.

115-1616 BIOGAS PROJECTS AND DECISION-MAKING MODELS: A BIBLIOMETRIC STUDY

Claudia Luengo, Student, Londrina State University, Brazil  
 Saulo Amâncio-Vieira, Professor, Londrina State University, Brazil  
 Daniela Yamaji, Student, Londrina State University, Brazil  
 Eduardo Contani, Professor, Londrina State University, Brazil  
 Reginaldo Fidelis, Professor, UTFPR-Campus Londrina, Brazil

This work presents the biogas and decision-making state of the art reported in the international literature. Therefore, the applied strategy is to identify and understand the theme approaches through bibliometric laws, descriptive statistics, and co-authorship networks to map and identify productions related to the theme.

## Wednesday, 02:45 PM - 04:15 PM

115-1848 Harvesting Solar Power Foments Prices in a Vicious Cycle: Breaking the cycle with price mechanisms

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

Fariba Farajbakhsh Mamaghani, Assistant Professor, Tulane University, United States

Distributed solar power generation is growing but not necessarily benefiting the utility firms. Reducing the demand, it hinders the coverage of utility costs with reasonable retail electricity prices. We provide a profit maximization formulation for a utility and reveal the interaction between optimal price increases and growing solar power adoption.

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### Invited Session

399	Wednesday, 02:45 PM - 04:15 PM, Celebration 3	Track: Healthcare Operations Management
	Invited Session: <b>Managing Hospital Operations: Theory and Practice</b>	
	Chair(s): Nan Liu Miao Bai	

115-0092 Helping the Captive Audience: Advance Notice of Diagnostic Service for Hospital Inpatients

Miao Bai, Assistant Professor, University of Connecticut, United States

Nan Liu, Associate Professor, Boston College, United States

Zheng Zhang, Assistant Professor, Zhejiang University, China

Inpatients are often treated as "on-demand" for hospital diagnostic service, and they are notified only when service capacity is available. This arrangement causes chaos and inefficiencies in operations. We propose "advance notice", an innovative scheduling paradigm that strikes a fine balance between the classic advance scheduling and allocation scheduling paradigms.

115-0353 Prediction-Driven Surge Planning with Application in the Emergency Department

Yue Hu, Post Doc/Researcher, University of Chicago, United States

Carri Chan, Professor, Columbia University, United States

Jing Dong, Associate Professor, Columbia University, United States

We study a two-stage prediction-driven nurse staffing framework where the prediction models are integrated with the base (made weeks in advance) and surge (made nearly real-time) staffing decisions in the ED. We propose a near-optimal two-stage staffing policy and identify the importance of balancing demand uncertainty versus system stochasticity.

115-1152 Telehealth in Acute Care: Pay Parity and Patient Access

Ozden Cakici, Assistant Professor, American University, United States

Alex Mills, Associate Professor, Baruch College, United States

Telehealth pay-parity policy requires payers to reimburse healthcare providers equally for telehealth and office visits. Using a three-stage game, we study the impact of telehealth reimbursement on provider's operational decisions, where patients choose between telehealth and office. We find that pay parity can decrease patient access and discuss its implications.

115-1214 Automated Data-Driven Modeling and Simulation of a Large Hospital Emergency Department (ED)

Dmitry Krass, Professor, University of Toronto, Canada

Opher Baron, Professor, University of Toronto, Canada

Arik Senderovich, Assistant Professor, York University, Canada

We seek to develop an automated data-driven simulation model of a large hospital ED in Toronto using event log data, process mining and queue mining techniques. Our particular interest is in evaluating the impact of consults. We find that while the first-order effects are relatively minor, the second-order effects are stronger.

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### Contributed Session

400	Wednesday, 02:45 PM - 04:15 PM, Celebration 4	Track: Healthcare Operations Management
	Contributed Session: <b>Telemedicine and E-visits</b>	
	Chair(s): Yuqiong Jiang	

115-0006 Optimal Location of Remote Dental Units

Jong Youl Lee, Student, University of Rochester, United States

Balaraman Rajan, Associate Professor, California State University East Bay, United States

Abraham Seidmann, Professor, Boston University, United States

Remote dental units can address the gap in patient access by providing basic services to rural areas and issuing follow-up e-referrals for complex services. By combining location optimization with follow-up e-referrals for complex care, we demonstrate how technology can make a regional medical service for an underserved population economically sustainable.

115-0075 Free for consulting or not? Online health consulting services considering patient-generated information and system-generated information

Yuqiong Jiang, Student, Tianjin University, China

Zhaofang Mao, Professor, Tianjin University, China

Considering quality information asymmetry and waiting time information asymmetry between patients and the provider, we develop a two-stage queueing model to study the optimal service rate, price and the time of providing FOHCS to maximize either his revenue or total welfare.

115-0568 Tele-Follow-Up and Outpatient Care

## Wednesday, 02:45 PM - 04:15 PM

Wei Gu, Associate Professor, University of Science and Technology Beijing, China

Meng Li, Associate Professor, University of Houston, United States

Shujing Sun, Assistant Professor, University of Texas at Dallas, United States

We examine the impact of telemedicine on follow-up care by collaborating with a large Asian hospital. We find that the adoption of telemedicine significantly increases the follow-up volume and it generates positive spillover effects on onsite operations. We further examine the mechanisms underlying these effects.

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115-1369 Pooling physical and virtual services with application to telehealth

Omer Berk Olmez, Student, CUNY, Baruch College, United States

Alex Mills, Associate Professor, Baruch College, United States

Healthcare services can be offered both in-person and virtually by the same providers. We study a clinic's decision of whether to pool and how to prioritize the two modes of care, in the case where patients decide between physical and virtual care while observing the waiting time for both modes.

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### Invited Session

401	Wednesday, 02:45 PM - 04:15 PM, Celebration 5	Track: Healthcare Analytics
	Invited Session: <b>Methods for Learning from Healthcare Data</b>	
	Chair(s): Shannon Harris	

115-0299 Impact of Social Determinants of Health on Cancer Care: A Predictive Model

Suman Niranjani, Assistant Professor, University of North Texas, United States

Chan Shen, Associate Professor, Penn State University, United States

Russell Torres, Assistant Professor, University of North Texas, United States

Usha Sambamoorthi, Professor, University of North Texas - HSC, United States

Abhinandan Chowdhury, Associate Professor, Savannah State University, United States

The study is focused on developing a prognostic model to predict cancer care for patients aged 60 years and above living in USA. We focus on breast, lung and bronchus, prostate, and colorectal. Supervised machine learning models are used to analyze a large medicare dataset from United States.

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115-0772 Identifying Influential Individuals and Predicting Future Demand of Chronically Ill Patients.

Zlatana Nenova, Assistant Professor, University of Denver, United States

Valerie Bartelt, Assistant Professor, University of Denver, United States

We develop and evaluate a generalizable modeling framework that utilizes LDA and clustering models, identifies high impact and stable-demand customers, and predicts the medium-term demand for services of stable-demand customers. We also use statistical tools to examine the impact of every predictor on the LDA prediction quality.

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115-1267 Optimizing the Return from a Machine Learning Model when Resources are Constrained

Jerrold May, Professor, University of Pittsburgh, United States

Johnson Moore, Post Doc/Researcher, University of Pittsburgh, United States

Luis Vargas, Professor, University of Pittsburgh, United States

Shannon Harris, Assistant Professor, Virginia Commonwealth University, United States

We propose a new methodology to address the problem of producing a ranking of observations, e.g., patients, when it is important that the ranking be particularly accurate near the top of the list. We illustrate our model using data from a healthcare clinic.

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### Invited Session

402	Wednesday, 02:45 PM - 04:15 PM, Celebration 6	Track: Healthcare Analytics
	Invited Session: <b>Analytics for Healthcare</b>	
	Chair(s): Guang Cheng	

115-0605 The Impact of Release Times for Operating Rooms on Surgery Waiting Times

Guang Cheng, Student, National University of Singapore, Singapore

Mitchell Tsai, Associate Professor, University of Vermont, United States

Joel Goh, Associate Professor, NUS Business School, Singapore

In this study, we empirically evaluate the relationship between implementing a 7-day release policy in operating room and surgery waiting times. Our results show that a 7-day release policy can reduce surgery waiting times.

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115-0984 Estimating Patient Health Transition From Data Censored by Treatment-effect-based Policies

Qian Luo, Assistant Professor, Xi'an JiaoTong-Liverpool University, Singapore

Hai Wang, Assistant Professor, Singapore Management University, Singapore

Zhichao Zheng, Associate Professor, Singapore Management University, Singapore

Haidong Luo, Assistant Director, National University Hospital, Singapore

Oon Ooi, Cardiothoracic surgeon, National University Hospital, Singapore

Treatment-effect-based policies leverage predictive information on patient health transitions for medical interventions. This significantly censors observed health transitions and subsequently distorts the estimation of transition probability matrices (TPMs). We propose a structural model to estimate TPMs from censored transition observations and show our estimators are consistent and asymptotically normally distributed.

## Wednesday, 02:45 PM - 04:15 PM

115-1123 Cost-effectiveness Analysis for Lethal Ovitrap Network for Prevention and Control of Dengue Fever

Yvonne Zhu, Student, National University of Singapore, Singapore  
Joel Aik, Director, National Environment Agency, Singapore  
Shuzhen Sim, Director, National Environment Agency, Singapore  
Joel Goh, Associate Professor, NUS Business School, Singapore

We evaluated the system-level cost-effectiveness of a network of lethal ovitraps for Dengue control. Benefits were modeled using an age-stratified multiple-infection epidemiological model and measured as reductions in disability-adjusted-life-years (DALYs). We estimated labor costs by modeling the workload needed for periodic maintenance of the traps via Traveling Salesmen Problems (TSPs).

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### Contributed Session

403

Wednesday, 02:45 PM - 04:15 PM, Celebration 7

Track: Sustainable Operations Management

Contributed Session: **Socially Responsible Operations**

Chair(s): Alexander Bloemer

115-0936 Mandatory disclosure of supply network maps: A blessing for sustainability but a curse for competitiveness?

Alexander Bloemer, Student, Technical University of Munich, Germany  
Stefan Minner, Professor, Technical University of Munich, Germany

Mandatory disclosures of supplier lists to improve sustainability can reduce a brand's competitiveness as other brands can access proprietary supplier information. We analyze how asymmetric competitors react on demanded disclosure in their dynamic relationships to suppliers, considering relation flexibility and the resulting suppliers' efforts in sustainability.

115-1008 Safety in Lithium-ion Battery Circular Activities: Safe Return to a Sustainable World

Zhuowen Chen, Student, Worcester Polytechnic Institute, United States  
Joseph Sarkis, Professor, Worcester Polytechnic Institute, United States  
Yildizbasi Abdullah, Post Doc/Researcher, Worcester Polytechnic Institute, United States

Lithium-ion battery (LIB) End-of-life (EOL) management safety can disrupt circular practice. LIB safety risks and impacts in EOL management are evaluated using input from experts. A framework and research propositions are presented.

115-1858 Firm's Environmental Misconduct, CSR Reputation, and Liability of Foreignness

Stewart Miller, Professor, University of Texas at San Antonio, United States  
Kefeng Xu, Professor, University of Texas at San Antonio, United States  
Sarfaz Khan, Assistant Professor, University of Louisiana at Lafayette, United States  
Lorraine Eden, Emeritus Professor, Texas A&M University College Station, United States

We develop a theoretical framework to examine local media coverage of CSR violations by domestic and foreign firms. We draw upon expectancy violation theory and ingroup-outgroup literature to examine how foreignness influences the likelihood of media coverage following environmental misconduct and moderates the effect of CSR reputation on media coverage.

115-2015 Retreat, Defend, or Attack? Optimal Investment Decisions in Green Technology under Competition

Osman Alp, Associate Professor, University of Calgary, Canada  
Tarkan Tan, Professor, University of Zurich, Switzerland  
Maximiliano Udenio, Associate Professor, KU Leuven, Belgium

We analyze a focal firm's optimal green investment strategy when there is uncertainty in green market potential and in the competitors' actions. The optimal policy composes of Retreat, Defend, and Attack strategies, one of which is optimal based on the problem parameters.

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### Contributed Session

404

Wednesday, 02:45 PM - 04:15 PM, Celebration 8

Track: Sustainable Operations Management

Contributed Session: **Empirical Sustainable Operations**

Chair(s): Kanwalroop Dhanda

115-1235 IMPACT OF POLLUTION IN THE PUBLIC LIGHTING SERVICE: CONTROLLING UNDESIRABLE OUTPUT

GEMMA PEREZ-LOPEZ, Associate Professor, University of Granada, Spain  
JOSE-LUIS ZAFRA-GOMEZ, Professor, University of Granada, Spain  
PABLO POVEDANO, Student, University of Granada, Spain  
LORENA MARQUEZ, Student, University of Granada, Spain

The analysis of the efficiency in the provision of local public services must consider both perspectives: the economic and the environmental management. So, we analyze the public lighting service efficiency, controlling its undesirable output (lighting pollution). A DEA model was applied, for a sample of 2,817 Spanish municipalities for 2014-2020.

115-2107 The linkage between Environmental performance and supply chains pre and post-Covid

Kanwalroop Dhanda, Professor, Sacred Heart University, United States  
Malik Mahfuja, Associate Professor, Sacred Heart University, United States

## Wednesday, 02:45 PM - 04:15 PM

Our project will empirically analyze the linkages between environmental and supply chain performance pre and post-Covid. Data on the supply chain metrics and firm performance variables, such as inventory turnover, inventory-to-sales ratios, firm size, and leverage, will be extracted from Compustat and ESG indicators from the MSCI database.

115-2119 POMJ's contributions to Sustainability and the Sustainable Development Goals - SDGs

Carlos Parra, Assistant Professor, Florida International University, United States  
Sushil Gupta, Professor, Florida International University, United States  
Hossein Rikhtehgar Berenji, Assistant Professor, Pacific University, United States

This study analyzes 2280 articles published in POMJ from 1992 to 2022, 187 studies are deemed to meaningfully allude to the terms "sustainability" and/or "sustainable." These are examined to establish ways in which Sustainability and the Sustainable Development Goals have been addressed and advanced in POMJ.

115-2143 Corporate Sustainability Practices by banks in Pakistan and their Financial Performance

Musa Khan, Post Doc/Researcher, Jiangsu University, China

This study uses content analysis to examine how Corporate Sustainability Practices affect Pakistan's top publicly traded commercial banks' Financial Performance from 2011 to 2021. The study has many contributions and implication for different stakeholders such as academia, regulators, and corporate sustainability practitioners.

### Contributed Session

405	Wednesday, 02:45 PM - 04:15 PM, Celebration 9	Track: Supply Chain Management
	Contributed Session: Supply Chain in Food and Health Care	
	Chair(s): Olushola Kolawole	

115-0407 Supply Chain Learning and Innovation to address Food wastage

Olushola Kolawole, Lecturer, Bradford University, United Kingdom

Supply chain learning (SCL) is one of the strategic methods of promoting innovation to solve organisational problems, particularly the problem of food waste & loss. However, there is limited research on how SCL can be a source of innovation to reduce FWL. In this research, we investigate how this can possible

115-1244 Illegal, Unreported, and Unregulated (IUU) Fishing Supply Chains: A Research Agenda

Orkun Baycik, Assistant Professor, Boston University, United States  
Canan Gunes Corlu, Associate Professor, Boston University, United States  
Alyssa Pierson, Assistant Professor, Boston University, United States  
James Greg McDaniel, Associate Professor, Boston University, United States

Illegal, Unreported, and Unregulated fishing steals income from legal fishers, relies on human trafficking for labor, and fuels other illicit activities. Further, it destroys oceanic ecosystems, contributing to climate change. We provide a research agenda for OM/OR community focusing on research challenges and opportunities to address these problems.

115-1270 Exploring the critical criteria matching supply with demand for supplies in a public health emergency

YIZHUO ZHOU, Student, Tongji University, Germany  
Axel Werwatz, Professor, Technische Universitat Berlin, Germany  
Jianjun Zhang, Associate Professor, Tongji University, China

This paper collected 12 expert opinions from universities, government and medical enterprises in China and Germany. Using Grey-DEMATEL method, we analyzed the criteria for developing short-term measures, long-term strategies, and important strategies for emergency supply and demand matching in major epidemics when taking different control policies in different countries.

115-1672 Lean supply chain management (LSCM) in the Canadian agri-food sector: A multiple case study

Fernando Naranjo, Assistant Professor, Niagara University, United States  
Larry Menor, Associate Professor, Ivey Business School, Western University, Canada  
P. Fraser Johnson, Professor, Ivey Business School, Western University, Canada

This qualitative inquiry illustrates, from a middle-range theorizing standpoint, the workings and the underpinnings of a reconceptualization of LSCM based upon the contextual contingent alignment between lean performance objectives (contextual factor) and supply chain management challenges (contingent condition) in the selection of lean approaches (contingent event) by Canadian agri-food firms.

### Invited Session

407	Wednesday, 02:45 PM - 04:15 PM, Celebration 11	Track: Manufacturing Operations
	Invited Session: Channel Management with Innovative Considerations	
	Chair(s): Xin Geng Xiaomeng Guo	

115-0462 Optimal Policies for Assembly Systems: Completing Rosling's Characterization

Shaokuan Chen, Lead Data Scientist, Kohl's Corporation, United States  
Wei Chen, Associate Professor, University of Kansas, United States  
Alp Muharremoglu, Research Scientist, Amazon.com, United States

## Wednesday, 02:45 PM - 04:15 PM

Rosling (1989) studies an assembly system with stochastic demand. Under the condition that the initial state of the system is in "long-run balance," the optimal policy is characterized as a balanced echelon base-stock policy. For the same model, we characterize the optimal policy without this condition.

115-1382 A distribution-free solution to a multi-period inventory problem with perishable inventory and backlogged demand

Yun Zhou, Associate Professor, McMaster University, Canada

We consider a perishable inventory problem in which items only last for one period and unsatisfied demand is backlogged. Given limited knowledge of demand distribution and a service level constraint, we analyze the performance of a distribution-free solution resulting from a simple heuristic.

115-1613 Personalized pricing strategies in a distribution channel

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 investigate the impact of the firms' setting personalized prices in a dyadic supply chain in presence of strategic consumers.

115-2064 Planning fallacy in online labor delivery

Kevin Hong, Professor, University of Miami, United States

Meng Li, Associate Professor, University of Houston, United States

Jason Wu, Post Doc/Researcher, University of Houston, United States

In this paper we seek to understand how workers may strategically promise their delivery time under planning fallacy, and how that may affect equilibrium delivery promise and impact different types of workers in online labor markets.

### Invited Session

408	Wednesday, 02:45 PM - 04:15 PM, Celebration 12	Track: Humanitarian Operations and Crisis Management
	Invited Session: Panel: Publishing Humanitarian Operations and Crisis Management Research in POM Journal	
	Chair(s): Erica Gralla Felipe Aros-Vera	

115-2112 Panel: Publishing Humanitarian Operations and Crisis Management Research in POM Journal

Erica Gralla, Associate Professor, George Washington University, United States

Felipe Aros-Vera, Associate Professor, Ohio University, United States

Sushil Gupta, Professor, Florida International University, United States

Maria Besiou, Professor, Kuehne Logistics University, Germany

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

This panel will feature editors and authors from the Disaster Management department of POM Journal to discuss the publishing process and what makes papers stand out and have an impact.

### Contributed Session

409	Wednesday, 02:45 PM - 04:15 PM, Celebration 13	Track: Humanitarian Operations and Crisis Management
	Contributed Session: Logistics II	
	Chair(s): Shraddha Rana	

115-1070 Game theory and optimization for facilitating coordination in humanitarian operations: a systematic review

Ayesha Farooq, Student, Kansas State University, United States

Jessica Heier Stamm, Associate Professor, Kansas State University, United States

A coordinated response from multiple entities engaged in humanitarian operations can enable optimal utilization of limited resources leading to more efficient and effective actions. We present analysis from a systematic review which explores how game theory and optimization can facilitate coordination. We highlight current trends and identify gaps in literature

115-1595 Truckload Transportation Procurement for Disaster Relief Distribution

Shraddha Rana, Student, Massachusetts Institute of Technology, United States

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

Chris Caplice, Post Doc/Researcher, Massachusetts Institute of Technology, United States

During disasters, both private and public sector actors engage in relief distribution. However, disaster conditions and competition for the same resources can make transportation procurement challenging. We use causal inference to determine the effects of disasters and public sector relief activities on private sector truckload prices to motivate collaboration.

115-1640 Using agent-based simulation to evaluate the effect of different supply patterns on social costs

Feizar Rueda-Velasco, Associate Professor, Universidad Distrital Francisco José de, Colombia

Miguel Jaller, Associate Professor, University of California Davis, United States

Eduyn López, Assistant Professor, Universidad Distrital Francisco José de, Colombia

This study developed an agent-based last-mile distribution model to evaluate the performance (e.g., social costs) of relief distribution strategies under various supply arrival patterns in a case study region in Colombia. Results show a larger negative impact from the timing of supply arrival than supply quantities.

## Wednesday, 02:45 PM - 04:15 PM

115-1950 Proactive and reactive response to seasonal natural disasters

Raktim Pal, Professor, James Madison University, United States

Santosh Mahapatra, Professor, Clarkson University, United States

We investigate the distinctive aspects of proactive and reactive inventory planning and replenishment in a multi-echelon operational system for meeting the relief demand due to recurrent, natural disasters in a season. The study compares the performance consequences against those of the traditional inventory planning and replenishment systems.

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### Contributed Session

410

Wednesday, 02:45 PM - 04:15 PM, Celebration 14

Track: Service Operations

Contributed Session: On-Demand/Platform Economy

Chair(s): Yanlu Zhao

115-0358 Stochastic Scheduling and Routing Decisions in Online Meal Delivery Platforms with Mixed Force

Yanlu Zhao, Assistant Professor, Durham University, United Kingdom

Laurent Alfandari, Professor, ESSEC Business School, France

Claudia Archetti, Professor, ESSEC Business School, France

This paper investigates stochastic scheduling and routing problems in the online meal delivery (OMD) service. We model the problem as a Markov Decision Process (MDP) and analyze the structural properties of the optimal policy. Then we propose four integrated approaches to solve the operational level scheduling and routing problem.

115-0396 On-Demand or Reservation? Service Mechanisms Exploration in Car-Hailing Platforms

Guangwen Kong, Associate Professor, Temple University, United States

Qingxia Kong, Associate Professor, Erasmus University Rotterdam, Netherlands

Yunan Liu, Associate Professor, North Carolina State University, United States

Ke Sun, Assistant Professor, Beijing University of Chemical Technology, China

Rui Zhu, Student, Shandong University, China

This paper considers a group of customers with heterogeneous waiting time costs and two service mechanisms: service on demand and service on reservation. We develop a queuing-game theory model to study the optimal pricing strategy and compare the performance of the two mechanisms.

115-0690 Information Provision in Online Service Platforms

Xin Weng, Student, Tsinghua University, China

Li Xiao, Assistant Professor, Tsinghua University, China

Lijian Lu, Assistant Professor, Hong Kong University of Science and Technology, China

We study the impact of wait time information distortion on customer join decision and the service provider's revenue in virtual queues. We show that the optimal revenue is first increasing and then decreasing in the distortion level. Customer joining rate could be either increasing or decreasing in the distortion level.

115-0711 Subscription vs. Spot Pricing in On-Demand Economy

Ming Hu, Professor, University of Toronto, Canada

Zhoupeng (Jack) Zhang, Student, Rotman School of Management, Canada

Taojie Qin, Student, Southwestern University of Finance and Economics, China

We study subscription and spot pricing in on-demand economy. Unlike subscription, spot pricing empowers the platform owner to dynamically control congestion and extract more consumer surplus, complementing the process of incentivizing gig workers and segmenting heterogeneous consumers. A hybrid pricing model, though, can yield higher profit than pure spot pricing.

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### Contributed Session

411

Wednesday, 02:45 PM - 04:15 PM, Celebration 15

Track: Information Systems and Operations Management

Contributed Session: Innovative models at the intersection of IS and OM

Chair(s): Karthik Kannan

115-0394 Cryptocurrency Rewards and Crowdsourcing Task Success

Shan Meng, Student, Xi'an Jiaotong University, China

Xia Zhao, Assistant Professor, University of Georgia, United States

Xi Zhao, Professor, Xi'an Jiaotong University, China

Crowdsourcing task success depends on the contributions from developers. This study investigates how the use of cryptocurrency token rewards affects the crowdsourcing task success and how the relationship depends on task features.

115-1444 Collaborative success in online communities: Explaining peer production performance in the 2022 R/place event

Shizhen Chen, Student, Emory University, United States

Tian Chan, Assistant Professor, Emory University, United States

Anandhi Bharadwaj, Professor, Emory University, United States



## Wednesday, 02:45 PM - 04:15 PM

When can individuals within an online community work effectively together? We empirically investigate this question using Reddit's r/place event. We show that communities with members that share common (viz-a-viz divergent) interests, and have a hierarchical (viz-a-viz flat) communication structure, perform better. We also identify conditions where hierarchical communication perform worse.

115-1449 Building Robust Supply Chains through Digitalization. The role of IT-Enabled Dynamic Capabilities

Caleb Kumi, Student, Kwame Nkrumah University of Science and Technology, Ghana  
David Asamoah, Associate Professor, Kwame Nkrumah University of Science and Technology, Ghana  
Francis Baidoo, Associate Professor, University of Texas Rio Grande Valley, United States  
Emmanuel Quansah, Lecturer, Kwame Nkrumah University of Science and Technology, Ghana  
John Marfo, Lecturer, Kwame Nkrumah University of Science and Technology, Ghana

In recent times, organizations across the global are faced with disruptions instigated by the COVID-19 pandemic. Consequently, the need to build robust supply chains is greater than ever. This study investigates how organizations can leverage supply chain digitalization to enhance supply chain robustness.

115-1850 Data Driven Decision Making in the Non-Profits Sector

Karthik Kannan, Assistant Professor, Southern Methodist University, United States

We analyze a quasi-experiment in which hundreds of non-profits arts organization in the US were provided with the training and tools to implement data driven decision making to improve their operations. We evaluate the impact of these tools using synthetic difference-in-differences methods.

### Invited Session

412	Wednesday, 02:45 PM - 04:15 PM, Coral Spring 1	Track: Emerging Topics in Operations Management
	Invited Session: <b>Emerging Topics in Operations Management</b>	
	Chair(s): Samayita Guha	

115-0617 The Sweet Point of Resource Allocation among Innovators with Differentiated Successful Probability

Li tianjiao, Student, Temple University, United States  
Subodha Kumar, Professor, Temple University, United States

Mounting new technology projects, tight product iterations, and innovation evidence has led firms to co-create with multiple innovators in differentiated projects. As allocating the same levels of resources to the differentiated innovators may undermines co-creation performance. We investigate how a profit-maximizing principal should properly allocate the limited resources.

115-0654 Optimal Subsidy Beneficiaries for Promoting Electric Vehicle Adoption

Bo Feng, Professor, Business department, China  
Jixin Zhao, Student, Department of Statistics, operations, and data science, United States  
Max Shen, Professor, University of California Berkeley, United States

Governments worldwide are offering subsidies to promote electric vehicle adoption. However, the issue of identifying optimal beneficiaries remains inadequately addressed. In this paper, we develop a game-theoretic model to explore whom to subsidize (i.e., consumers, manufacturers, or both) to better realize intended objectives under different distribution channels.

115-1953 Examining the Role of AI in protecting Maritime Supply Chains from Cyberattacks

Rafael Diaz, Associate Professor, Old Dominion University, United States  
Liuwang Kang, Post Doc/Researcher, University of Virginia, United States  
Katherine Smith, Assistant Professor, Old Dominion University, United States

Digital transformation is playing a critical role in maritime supply chains. As autonomous vehicles are expected to become more prevalent in port operations, risks for disruptions due to a cyberattack are more significant. We propose an AI method for anomaly detection and mitigation

### Invited Session

413	Wednesday, 02:45 PM - 04:15 PM, Coral Spring 2	Track: Elections and Political Management
	Invited Session: <b>Political Management</b>	
	Chair(s): Abhishek Ray	

115-0012 To Role of Online and Geographically Distant Social Networks in Political Decision-Making

Ecem Basak, Assistant Professor, Baruch College, United States  
Ali Tafti, Associate Professor, University of Illinois at Chicago, United States  
Min-Seok Pang, Associate Professor, Temple University, United States

In this study, we exploit Social Connectedness Index by Facebook that reflects social connections within the U.S., and we investigate the role of connectedness in political decision-making among individuals that are located across distant geographical regions. We also look at the heterogenous effects of social connectedness.

115-0014 Engagement by Enragement: The Economics of Online News

Abhishek Ray, Assistant Professor, George Mason University, United States  
Hossein Ghasemkhani, Assistant Professor, Purdue University, United States  
Cesar Martinelli, Professor, George Mason University, United States

## Wednesday, 02:45 PM - 04:15 PM

We study online partisan news framing and consumption in light of polarization and non-partisan news websites. We propose a simple game-theoretic framework to shed light on this issue and reveal some interesting results. E.g., we show that polarization can act to limit engagement-enhancing strategies of both neutral and partisan websites.

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### Invited Session

414	Wednesday, 02:45 PM - 04:15 PM, Blue Spring 1	Track: Supply Chain Risk Management
	Invited Session: <b>Managing Uncertainty in Supply Chains</b>	
	Chair(s): Charles Wang	

115-0275 The Role of Live-Streaming Commerce in a Dual-Channel Supply Chain

Haiying Yang, Assistant Professor, Missouri State University, United States

Zhengping Wu, Associate Professor, Syracuse University, United States

Zhuang Qian, Assistant Professor, Pennsylvania State University, United States

Live-streaming commerce is gaining popularity in recent years which provides an immersive and interactive shopping experience. This research explores different strategies of adopting live-streaming channel and its influence on supply chain optimization.

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115-1056 FIRM PERFORMANCE AND BUSINESS UNCERTAINTY WITH SUSTAINABILITY PRACTICES

Yabing Zhao, Associate Professor, San Francisco State University, United States

Zhuang Qian, Assistant Professor, Pennsylvania State University, United States

Many firms have implemented various sustainability practices nowadays to take on social responsibility and adapt to modern business and economy. In this study, we aim to uncover the role of firms' sustainability practices and initiatives by examining firms' performance and business uncertainty after implementing sustainability practices.

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115-1164 Revenue Management, Loyalty Program, and Online Travel Agency in Hotel Chains

SHUXIAN XIAO, Student, University at Buffalo, SUNY, United States

Charles Wang, Associate Professor, Suny At Buffalo, United States

Mike Wei, Associate Professor, University at Buffalo, United States

We consider a dual-channel supply chain consisting of a hotel and an OTA selling rooms to rational consumers. We identified consumers' segmentation, the OTA's optimal price, and the Hotel's optimal retail and wholesale prices and Gold-Status threshold. We showed that adding the OTA channel can benefit the hotel's performance.

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### Invited Session

415	Wednesday, 02:45 PM - 04:15 PM, Blue Spring 2	Track: Supply Chain Risk Management
	Invited Session: <b>Organizational Misconduct</b>	
	Chair(s): Rachna Shah Finn Petersen	

115-1326 Improving Inspection Resource Allocation to Mitigate Organizational Misconduct

Finn Petersen, Student, University of Minnesota, United States

Rachna Shah, Professor, University of Minnesota, United States

Researchers have started to predict organizational misconduct using public information. Yet, most social-control agents still only schedule inspections at regular intervals. We develop and empirically test a resource allocation model that incorporates decay in operational routines and Yelp reviews to optimally allocate inspection resources to detect health violations in restaurants.

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115-1364 Data Driven Security Selection for Wealth Management

Sikun Xu, Student, Washington University in St. Louis, United States

Ali Hirsa, Professor, Columbia University, United States

Miao Wang, Student, Columbia University, United States

Federico Klinkert, ASK2.AI, ASK2.AI, United States

Satyan Malhotra, ASK2.AI, ASK2.AI, United States

We propose an artificial intelligence-powered portfolio decision system for financial investments. In this paper we focus on utilizing online learning and regime-detection tools to improve mutual fund performance forecasts. Combining with modern machine learning models, we are able to provide robust investment decisions.

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115-1693 Illicit Distribution and Safety Implications: Misconduct in Opioid Supply Networks

Rowan Hilend, Student, Michigan State University, United States

Simone Peinkofer, Assistant Professor, Michigan State University, United States

Stan Griffis, Professor, Michigan State University, United States

The opioid epidemic remains a pervasive national issue with notable risks to stakeholder safety and relatedly, firm reputation. We leverage panel data to investigate the relationship between overdose rates and opioid manufacturer/distributor propensity to oversupply as a form of normal misconduct, considering external factors which exacerbate this distribution practice.

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# Wednesday, 02:45 PM - 04:15 PM

## Invited Session

417	Wednesday, 02:45 PM - 04:15 PM, Rainbow Spring 2	Track: Operational Excellence
	Invited Session: Achieving Service Operational Excellence	
	Chair(s): Peter Carrera      Kenneth Boyer	

115-0157 Order-Based Trade Credits and Operational Performance in the Nanostore Retail Channel

Rafael Escamilla, Student, Tilburg University, Netherlands  
Jan Fransoo, Professor, Tilburg University, Netherlands  
Santiago Gallino, Assistant Professor, The Wharton School, United States

The suppliers of 50 million nanostores face operational challenges as a result of nanostore shopkeepers' financial constraints. We empirically investigate a short-term trade credit policy that can resolve these challenges but comes with substantial default risk. We uncover the operational benefits and quantify the risk associated with this new policy.

115-0230 Human-AI teaming in screening child abuse reports

Yanhan (Savannah) Tang Tang, Student, Carnegie Mellon University, United States  
Zoey Jiang, Assistant Professor, Carnegie Mellon University, United States  
Alan Scheller-Wolf, Professor, Carnegie Mellon University, United States

Governmental offices dedicated to protecting children from abuse and neglect usually receive an overwhelming number of reports and must carefully screen calls before sending staff to investigate. An AI tool was deployed to assist screening by providing risk scores; this project studies the effect of AI in improving operations performance.

115-0365 The Value of Offering Free Ship-to-store Service for Online-exclusive Products

Yao Chen, Student, Clemson University, United States  
M. Serkan Akturk, Assistant Professor, Clemson University, United States  
Benjamin Grant, Assistant Professor, Clemson University, United States

Implementing free in-store pickup services has become widespread in retail industry as part of an omni-channel strategy. We analytically model the setting of free ship-to-store services for online-exclusive products. Our prescriptive models enable retailers to evaluate the value of offering such service along with expected customer purchase behavior after implementation.

115-0375 Integrating Different Operational Policies in Robotic Mobile Fulfillment Systems

Kerim Kizil, Student, Texas A&M University, United States  
Jon Stauffer, Assistant Professor, Mays Business School, Texas A&M University, United States  
Chelliah Sriskandarajah, Professor, Texas A&M University College Station, United States

We analyze a general Robotic Mobile Fulfillment (RMF) system characterized by human pickers, a robot fleet, and movable shelving pods. We outline and investigate three operations within this system: stowing, storing, and picking. Common operational policies are presented, and the interactions are explored both analytically and through discrete-event simulations.

## Contributed Session

418	Wednesday, 02:45 PM - 04:15 PM, Barrel Spring 1	Track: POM-Marketing Interface
	Contributed Session: Live Streaming and Gaming	
	Chair(s): Liu Ming	

115-0712 Influencing the Influencer with Influencer Encroachment

Luying Wang, Student, Tianjin University, China  
Yuyang Zhao, Student, Nanjing university of science and technology, China  
Yunchuan Liu, Associate Professor, University of Illinois Urbana-Champaign, United States

We study the effects of influencer encroachment on marketer engagement through word of mouth. An influencer encroaches on a seller's market by selling substitute a product to followers. Influencer also posts the seller's product review to followers and allows sponsorship from the seller for the seller's product promotion

115-1110 Why Do Gamers pay? The Interplay Among a Gamer's Behaviors and Optimal Marketing Campaign Planning

Ding Li, Assistant Professor, Nanjing University, China  
Xue Yang, Professor, Nanjing University, China  
De Liu, Associate Professor, University of Minnesota, United States

We propose a utility maximization framework to empirically study online gamers' decision-making process with multiple behavioral dimensions (e.g., play, pay, offline) where payment is not a premise for usage behaviors. Our derived joint model admits a gamer's time-varying enjoyment parameters. We further develop a Bayesian dynamic marketing planning tool.

## Invited Session

419	Wednesday, 02:45 PM - 04:15 PM, Barrel Spring 2	Track: Procurement and Supplier Management
	Invited Session: Information Design and Platform Operations	
	Chair(s): Heng Zhang      Yunduan Lin	

## Wednesday, 02:45 PM - 04:15 PM

115-0128 Personalized Assortment Optimization under Consumer Choice Models with Local Network Effects

Tong Xie, Student, Booth School of Business, United States  
Zizhuo Wang, Professor, Chinese Univ of Hong Kong (Shenzhen), China

We study the assortment optimization problem under the consumer choice model with localized network effects. We analyze it under star networks and show its NP-hardness. We propose the idea of “randomized assortments”. Under certain conditions, we prove that using a combination of two adjacent revenue-ordered assortments is optimal.

115-0622 Nonprogressive Diffusion on Social Networks: Approximation and Applications

Yunduan Lin, Student, University of California, Berkeley, United States  
Heng Zhang, Assistant Professor, Arizona State University, United States  
Renyu Zhang, Associate Professor, The Chinese University of Hong Kong, China  
Max Shen, Professor, University of California Berkeley, United States

We propose a general model to characterize nonprogressive diffusion and develop a fixed-point approximation (FPA) scheme to characterize the limiting adoption on a social network. This approximation scheme admits both a theoretical guarantee and computational efficiency. We show that the maximal deviation diminishes as the network size and density increase.

115-1395 From Customer Data to Product Design: A Statistical Learning Framework

Mengxin Wang, Student, University of California Berkeley, United States  
Meng Qi, Assistant Professor, Cornell University, United States  
Max Shen, Professor, University of California Berkeley, United States

Product design has been an important problem in the marketing and operations management literature. We develop a structural estimation and optimization method for determining optimal product design given customer data. We analyze the statistical performance of our method and discuss guidelines for efficient data collection.

115-1871 Mediated Persuasion via Blockchain

Kimon Drakopoulos, Assistant Professor, University of Southern California, United States  
Irene Lo, Assistant Professor, Stanford University, United States  
Justin Mulvany, Student, University of Southern California, United States

We relax the commitment assumption of classic Bayesian Persuasion by allowing Sender to communicate with Receiver through a blockchain mediator that sends a costly message to Receiver given Sender's reported state of the world. Surprisingly, we show that costly blockchain mediation succeeds where free mediation fails.

## Invited Session

420	Wednesday, 02:45 PM - 04:15 PM, Rock Spring	Track: POM-Economics Interface
	Invited Session: Empirical Research in Behavioral Operations	
	Chair(s): Bing Bai	

115-0313 When Top-Down Meets Bottom-Up: How Governmental Devolution Affects Online Giving Behavior

Anqi Wu, Assistant Professor, Florida International University, United States  
Aravinda Garimella, Assistant Professor, University of Illinois at Urbana Champaign, United States  
Ramanath Subramanyam, Associate Professor, University of Illinois Urbana-Champaign, United States

Focusing on adequacy and equity in public education, this study examines how top-down efforts driven by policy makers interact with bottom-up efforts of online donors facilitated by crowdfunding platforms. We find simultaneous evidence of two contrasting donor tendencies following the announcement of a prominent recent devolution policy.

115-1136 Information and Bias Effects in Discretionary Pricing: Evidence from Pricing Experiments

Xinyu Shirley Liang, Student, University of Michigan Ann Arbor, United States  
Yixin Iris Wang, Assistant Professor, University of Illinois Urbana-Champaign, United States  
Jun Li, Associate Professor, University of Michigan - Ann Arbor, United States

Contradict to pricing theory that suggests that discretionary pricing improves performances, decision-makers are vulnerable to behavioral biases that lead to inaccurate demand estimation. We first analyze a field experiment and show that managers significantly increased prices, leading to revenue reduction. We further investigate the behavioral mechanisms with a lab experiment.

115-1350 Algorithmic Discrimination on E-Commerce Platforms: Evidence from JD.COM

Zihan Zhao, Student, Washington University in St. Louis, United States  
Renyu Zhang, Associate Professor, The Chinese University of Hong Kong, China  
Dennis Zhang, Associate Professor, Washington University in St. Louis, United States

E-commerce platforms that function as both marketplaces and retailers may abuse their dominating market power to discriminate against third-party sellers algorithmically. We develop an integrated modeling and empirical framework to identify the algorithmic discrimination against third-party sellers on a platform and uncover the underlying mechanism of algorithmic discrimination.

115-1642 The Impacts of Algorithmic Work Assignment on Fairness Perceptions and Productivity

Bing Bai, Student, Washington University in St. Louis, United States  
Hengchen Dai, Associate Professor, University of California Los Angeles, United States  
Dennis Zhang, Associate Professor, Washington University in St. Louis, United States  
Fuqiang Zhang, Professor, Washington University St Louis, United States

## Wednesday, 02:45 PM - 04:15 PM

We study how algorithmic (vs. human-based) task assignment processes change workers' fairness perceptions and productivity. In two field experiments where warehouse picking workers received tasks either from an algorithm or a human, we find that the algorithmic assignment process was perceived as fairer and yielded productivity gains.

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### Invited Session

421	Wednesday, 02:45 PM - 04:15 PM, Regency Ballroom Q	Track: Revenue Management and Pricing
	Invited Session: Data-driven Algorithms in Sequential Decision Makings	
	Chair(s): Sentao Miao	

115-0163 Sequential Search with Acquisition Uncertainty

David Brown, Professor, Duke University, United States  
Cagin Uru, Student, Duke University, United States

We study a variation of the classical Pandora's problem in which the availability and acquisition of alternatives are uncertain. We develop and study a class of take-it-or-leave-it threshold policies. We show that these threshold policies are asymptotically optimal and achieve a constant-factor guarantee of  $1-1/e$ .

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115-0269 Online Learning for On-demand Vehicle sharing Networks with Pricing

Saif Benjaafar, Professor, University of Minnesota, United States  
Xiangyu Gao, Assistant Professor, The Chinese University of Hong Kong, Hong Kong, China  
Xiaobing Shen, Student, University of Minnesota, United States  
Huanan Zhang, Assistant Professor, University of Colorado Boulder, United States

We consider the pricing decisions for on-demand vehicle sharing networks in an online learning setting. We use a search subroutine to approximately locate the price with a desired demand for each trip and estimate the gradient information at this price point. We develop an online learning algorithm with performance guarantees.

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115-0502 Distributionally Robust Multilocation Newsvendor at Scale: A Scenario-Based Linear Programming Approach

Chenxi Li, Student, School of Management & Economics, China  
Sheng Liu, Assistant Professor, Rotman School of Management, Canada  
Wei Qi, Associate Professor, Tsinghua University Department of IE, China  
Lun Ran, Professor, Beijing Institute of Technology, China  
Aiqi Zhang, Post Doc/Researcher, University of Toronto, Canada

How should retailers and sellers distribute inventory across a large network of (potentially hundreds of) distribution centers? We study a distributionally robust multilocation newsvendor problem with a scenario-based approach, providing an accurate and scalable LP reformulation for general location settings and characterizing optimal inventory decision for a symmetric two-location problem.

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115-1018 The Benefits of Delay to Online Decision-Making

Yaqi Xie, Student, University of Chicago, United States  
Will Ma, Assistant Professor, Columbia University, United States  
Linwei Xin, Associate Professor, University of Chicago, United States

To make better online decisions, one common practice is delaying irrevocable real-time decisions; however, decisions cannot be delayed forever. We study this fundamental trade-off and prove that the regret decays exponentially in the delay length. Both our theoretical and empirical results suggest that a little delay is all we need.

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### Contributed Session

422	Wednesday, 02:45 PM - 04:15 PM, Regency Ballroom O	Track: Retail Operations
	Contributed Session: Data-driven strategies in retail operations	
	Chair(s): Mario Chong	

115-0414 Wholesalers' DSS based on a hierarchical family basket and machine learning techniques applied in Colombia

Jhon Segura-Dorado, Student, Corporación Universitaria Comfacaucua - Unicomfacaucua, Colombia  
Helmer Paz Orozco, Professor, Corporación Universitaria Comfacaucua, Colombia  
Ana Luna, Professor, Universidad del Pacífico, Brazil  
Mario Chong, Professor, Universidad del Pacífico, Brazil  
Julio Castillo, Assistant Professor, Universidad del Pacífico, Peru

This research proposes a wholesaler's decision support system to maximize their value proposal considering product mix, market environment, and operative plan conditions. It uses hierarchical family baskets and machine learning techniques focusing on classification methods.

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115-0529 Predictably Unpredictable: How Judgmental Forecasts and Machine Learning Predictions Complement Each Other

Devadrita Nair, Student, WHU - Otto Beisheim School of Management, Germany  
Arnd Huchzermeier, Professor, WHU - Otto Beisheim School of Management, Germany

We present a seasonal demand forecast using machine learning methods in combination with expert forecasts and clickstream data. Judgmental forecasts prove to be instrumental as product innovation can be radical and market information is withheld until product launch. Hybrid models can improve the forecasts further.

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## Wednesday, 02:45 PM - 04:15 PM

### Invited Session

423	Wednesday, 02:45 PM - 04:15 PM, Regency Ballroom P	Track: Disruptive Technologies and Operations Management
	Invited Session: Design of Platforms	
	Chair(s): Yumei He	

115-0649 You Should Diversify, but Why? Multi-Platform Social Media Strategy and E-Commerce Performance

Xiaoning Wang, Student, University of Pennsylvania, United States  
Yakov Bart, Associate Professor, Northeastern University, United States  
Serguei Netessine, Professor, The Wharton School, United States  
Lynn Wu, Associate Professor, University of Pennsylvania, United States

Using a panel dataset on e-commerce social media metrics and performance indicators, we find that holding other factors constant, companies adopting a more diversified social media strategy perform better than those using a more concentrated strategy, because a more diversified social media strategy is positively associated with greater purchase intentions.

115-0858 Implementing an AI Assistant to Boost Sales and Reduce Product Returns in Livestream Selling

Lingli Wang, Assistant Professor, Beijing university of post and telecommunications, China  
Yumei He, Assistant Professor, Tulane University, United States  
Jiandong Ding, Product Manager, Alibaba Group, China  
Ni Huang, Associate Professor, University of Miami Business School, United States

In partnership with the worldwide largest livestream selling platforms, we conduct a randomized field experiment wherein consumers in treatment group can interact with an AI-powered streamer assistant that recognizes consumers' potential needs and provides personalized services while consumers in control group cannot. We have detailed findings ready.

115-1496 The Dark Side of the Restaurant Guide: Effects on Multiple Consumer Expectations and Rating Behaviors

Hui Yang, Student, Fudan university, China  
Xianghua Lu, Professor, Fudan university, China  
Tian Lu, Assistant Professor, Arizona State University, United States

Based on expectation-related theories, we explored the effect of being listed in the guide (BLG) on consumers' rating intentions and rating scores. Moreover, we introduced the zone of tolerance framework to investigate the effect of BLG on consumers' adequate and desired expectations, consumers' complaint, compliment, and neutral rating behaviors.

### Contributed Session

424	Wednesday, 02:45 PM - 04:15 PM, Silver Spring 1	Track: Data Science and Analytics
	Contributed Session: Data Analytics Methods and Applications	
	Chair(s): Sanjeev Bordoloi	

115-0277 Visualizing the Implicit Model Selection Tradeoff

Zezen (Dawn) He, Student, University of Rochester, United States  
Yaron Shaposhnik, Assistant Professor, Simon Business School, United States

Empirical evidence suggests that often multiple predictive models attain competitive results while internally operating differently. This results in an implicit tradeoff in models' performance throughout the feature space, resolving of which requires new model selection tools. This work explores new methods for uncovering the implicit model selection tradeoff.

115-0776 Personalized inference for partial association: acknowledging heteroscedasticity and differentiating subpopulations

Jiawei Huang, Student, Carl H. Lindner College of Business, OBAIS Department, United States  
Dungang Liu, Associate Professor, Carl H. Lindner College of Business, OBAIS department, United States

To address 2 common issues in the social survey (1) ordinal scale and (2) small sample size. We developed a "surrogate" method which creates continuous representations for ordinal responses, then uses quantitative numbers or visualization plots to access partial association for subpopulations. We also achieved personalized inference through sample smoothing.

115-1120 Application of DEA in Performance Evaluation of Cricket Players

Sanjeev Bordoloi, Associate Professor, University of St. Thomas, United States

We applied Data Envelopment Analysis (DEA) technique to evaluate efficiency of cricket players by collecting data from Indian Premier League (IPL). Interpretation of both batsmen and bowlers performances was made based on DEA results to run scenario analyses to help players and teams improve their overall performance.

115-1777 A Novel, Expert-Augmented, Supervised Feature Selection Methodology

Meysam Rabiee, Assistant Professor, University of Colorado Denver, United States

In this work, we propose an extra layer to the traditional way of feature selection by including experts' (academics and practitioners) opinions on the selection of the features, a process we refer to as expert-augmented feature selection.

115-1982 A Survey on Text Mining in Indian Languages

Prabin Kumar Panigrahi, Professor, INDIAN INSTITUTE OF MANAGEMENT INDORE, India

## Wednesday, 02:45 PM - 04:15 PM

Text mining in English language has been researched extensively in past. A large amount of textual data is available in Indian languages. In this paper, we survey the availability of existing resources, and tools for text mining, work done so far and various challenges of text mining in Indian languages.

### Invited Session

426	Wednesday, 02:45 PM - 04:15 PM, Winter Park 49	Track: Product Innovation and Technology Management
	Invited Session: Contemporary Topics in Innovation Management	
	Chair(s): Fabrizio Salvador	

115-1031 Peer Effects and Learning with New Technology

Deepanshi Bhardwaj, Student, UCL School of Management, United Kingdom

Bilal Gokpinar, Professor, University College London, United Kingdom

We investigate peer effects in a knowledge-intensive work setting with individual-based competitive incentives where service workers are introduced to a new technology. Using a granular data of 10 million transactions for 822 banking-service-workers, we find that workers with peers have lower error-rates as compared to those without peers.

115-1472 Poisoned Apples: How Project Team Experiential Diversity Impacts Project Performance and Voluntary Turnover

Yunfan Wang, Student, IE BUSINESS SCHOOL, Spain

Fabrizio Salvador, Professor, IE Business School, Spain

Emmanouil Avgerinos, Associate Professor, IE BUSINESS SCHOOL, Spain

Marco Caserta, Assistant Professor, IE BUSINESS SCHOOL, Spain

Joining a project team whose members have heterogeneous experiences presents a learning opportunity to its constituents, and hence can affect project performance. Yet it remains unclear how team experiential diversity impacts the retention of human capital. We investigate these questions using 814 project teams from a multinational consulting firm

115-2027 An Investigation of Abstraction and Traversals in Creative Problem-solving in IKEA Hacks

Shi-Ying Lim, Assistant Professor, National University of Singapore, Singapore

Tian Chan, Assistant Professor, Emory University, United States

Conceptualizing creative problem-solving as search, we theorize how individuals navigate between problem and solution spaces. Using a dataset of user-initiated IKEA hacks, we show that successful creative problem-solving involve: 1. starting with problems, 2. frequent traversal of problem-solution landscapes, 3. decreased persistence within landscapes and 4. ending with abstract solutions.

### Invited Session

427	Wednesday, 02:45 PM - 04:15 PM, Winter Park 50	Track: Socially Responsible Operations
	Invited Session: Challenges of Responsible Operations and Supply Chain Management	
	Chair(s): Prashant Chintapalli	

115-0608 Vertical Channels with Manufacturer-Quality and Retailer-Effort Induced Demand in the Presence of Strategic Inventory

Abhishek Roy, Assistant Professor, Temple University, United States

Ganesh Balasubramanian, Assistant Professor, T A Pai Management Institute, MAHE, India

Existing literature on strategic inventory does not consider the effect of the effort exerted by the manufacturer and retailer to stimulate demand. We examine how strategic inventory affects the manufacturer's choice of quality, and the retailer's choice of selling effort, both of which influence the market demand and social welfare.

115-0693 Bad Lead Time: Negative Consequences of Long Waiting Time - Evidence from the Israeli Court

Shany Azaria, Student, Tel Aviv University, Israel

Noam Shamir, Assistant Professor, Tel Aviv University, Israel

This paper describes a data-driven approach to study negative operational consequences of congestion, demonstrated in court system environment. Using data from the Israeli court system, we try to econometrically estimate the effect of long waiting times, an outcome of congestion, on cost.

115-0714 Price and Quantity Promotions for Clearance Sales: Implications for Sustainability and Profitability

Arvind Sainathan, Associate Professor, NEOMA Business School, France

Fang Liu, Associate Professor, University of Chinese Academy of Sciences, China

We consider a retailer who does clearance pricing to sell off the excess inventory of a certain product. In this context, we compare quantity-based discounts with traditional price discounts. Specifically, we develop models to examine how these policies compare in terms of retailer's sustainability (product wastage) and her profitability.

115-1285 Index-Based Yield Protection for Smallholder Farmers

Kehan Lu, Student, Duke University Durham, United States

Jing-Sheng Song, Professor, Duke University Durham, United States

Can Zhang, Assistant Professor, Duke University, United States

Our research studies an innovative index-based yield protection offered by governments under which smallholder farmers are subsidized when a pre-determined index predicts a low yield level. We explore the optimal design and value of such index-based policy. We also study its performance with the existence of a price protection.

**Wednesday, 02:45 PM - 04:15 PM**



## Wednesday, 04:30 PM - 06:00 PM

### Contributed Session

430	Wednesday, 04:30 PM - 06:00 PM, Celebration 1	Track: Agriculture and Food Supply Chains
	Contributed Session: Food Processing and Foodservice	
	Chair(s): SACHIN KAMBLE	

115-0122 Digital twin for manufacturing excellence in food processing industries

SACHIN KAMBLE, Professor, EDHEC Business School, France  
Pratik Maheshwari, Assistant Professor, Indian Institute of Management Jammu, India

Digital Twin (DT) is a dynamic capability attracting significant attention from both practitioners and academia. DT technologies has potential use in food processing industries for performance improvement. We develop a DT and demonstrate the benefits using a implementation case study in a food processing company using simulation.

115-0201 Exploring Challenges to Street Food Safety Compliance in a Developing Economy

Abigail Adaku, Lecturer, University of Ghana, Ghana  
Irene Egyir, Associate Professor, University of Ghana, Ghana  
Cynthia Gadegbeku, Lecturer, University of Ghana, Ghana

Most street food safety risks are avoidable with vendors compliance to the stipulated regulations. How researchers and policymakers describe the challenges also affects how they address it. Using focus group discussions, this study provides an understanding of street food safety challenges. The key finding is vendors lack incentives to comply

115-0292 The dark- and bright- sides of supplier development in the agri-food industry: a SET perspective

Phuong Tran, Lecturer, University of Bristol Business School, United Kingdom  
Matthew Gorton, Professor, Newcastle University, United Kingdom  
Fred Lemke, Professor, Vlerick Business School, Belgium

Based on Social Exchange Theory, we conceptualise the outcomes of supplier development initiatives, validating our model based on data for the agri-food sector in Vietnam. Results indicate that supplier development initiatives concurrently lead to both positive and negative consequences and we explain the mediating role played by relational norms.

115-1823 The Impact of a Country's Logistics Performance on Food Insecurity

Camil Martinez, Professor, University of Los Andes, Colombia  
Andrés Naranjo, Student, Universidad De Los Andes, Colombia

This is an empirical study using public data from FAO and World Bank to understand how the impact of the logistics performance of a country impacts the country's food insecurity percentage. The results have public policy implications. More detailed analysis is applied to Colombia.

115-1885 Ready, Steady, Sprint: From traditional foodservice to nimble-squad

Roula Michaelides, Reader, Manchester Metropolitan University, United Kingdom  
Zenon Michaelides, Reader, Manchester Metropolitan University (MMU), United Kingdom  
Santosh Maruti Salunkhe, Post Doc/Researcher, Manchester Metropolitan University (MMU), United Kingdom

Escalating energy costs, tightening profit-margins, unplanned distribution demands have made the foodservice-sector vulnerable to supply-chain fragility and limited their capability to innovate in times-of-crisis. Using data from a UK foodservice firm, this paper explores their agile-projectification journey as response to cultivate resilience

### Invited Session

431	Wednesday, 04:30 PM - 06:00 PM, Celebration 2	Track: Energy and Natural Resource Management
	Invited Session: Energy operations and climate change	
	Chair(s): Wei Qi     Aiqi Zhang	

115-0692 Toward Climate Resilient Cities: Robust Planning Against Extreme Rainfalls

Sheng Liu, Assistant Professor, Rotman School of Management, Canada  
Wei Qi, Associate Professor, Tsinghua University Department of IE, China  
Aiqi Zhang, Post Doc/Researcher, University of Toronto, Canada

We are experiencing prolonged and intensified rainfall in our cities due to climate change. Unfortunately, existing efforts for infrastructure design hardly meet the urgent need. Leveraging robust optimization techniques, this paper identifies the worst-case rainfall scenarios that cause greatest flooding losses and propose prescriptive solutions for optimal stormwater infrastructure designs.

115-0874 Slowly Varying Machine Learning for Energy Consumption Prediction

Vasileios Dugalakis, Student, Massachusetts Institute of Technology, United States  
Dimitris Bertsimas, Professor, MIT Operations Research Center, United States

We introduce the framework of slowly varying machine learning, whereby the model varies smoothly under some graph-based temporal or spatial structure, through application in energy consumption prediction. For sparse regression, we present theoretical advances for the underlying mixed-integer optimization problem. For decision trees, we address long-standing challenges concerning their stability.

115-1000 Behind the Meter Distributed Energy Resources: Arbitrage and Advantages

Aaron Heinrich, Student, Texas A&M University, United States

## Wednesday, 04:30 PM - 06:00 PM

Trevor Hale, Professor, Texas A&M University, United States  
Jennifer Blackhurst, Professor, University of Iowa, United States  
Bill Anderson, Director, United States Navy, United States

The advent of behind-the-meter distributed energy resources enable researchers to develop various strategies aimed at leveraging them as means not only to reduce electric bills but also to drive them negative, viz., arbitrage. To catalyze progress in this emerging domain of OM research, we delineate a research taxonomy.

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115-1248 Dynamic Valuation of A Battery with Performance Degradation

Joonho Bae, Student, University of Michigan - Ann Arbor, United States  
Roman Kapuscinski, Professor, University of Michigan Ann Arbor, United States  
John Silberholz, Assistant Professor, University of Michigan, United States

Quantifying the operating cost of a battery is a key challenge for economic profitability. This paper analytically studies the optimal dynamic policy under two types of battery performance degradation and shows that a huge portion of profits can be missed with the heuristics used in the practice/literature.

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### Invited Session

432	Wednesday, 04:30 PM - 06:00 PM, Celebration 3	Track: Healthcare Operations Management
	Invited Session: Empirical Healthcare Operations Management	
	Chair(s): Masoud Kamalahmadi	

115-0003 Empirical Analysis of Determinants of Patient Appointment Punctuality

Hedayat Alibeiki, Assistant Professor, California State University San Marcos, United States

Understanding the causes of patient unpunctuality can help better design the queuing systems and appointment arrival policies. This study aims to investigate the potential factors that may affect the patients' arrival time to their outpatient appointments.

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115-0326 When Do People Switch Queues? An Empirical Study of Discretionary Queue Switching

Yina Li, Associate Professor, University of Science and Technology of China, China  
Zhijian Cui, Professor, University of Science and Technology of China, China  
Jiuchang Wei, Professor, University of Science and Technology of China, China

This study investigates the behavioral mechanisms driving queuer's switching decisions in a queueing system with the option of discretionary switching. Our results support the U-shaped relationship between examinees' tendency to switch and service progress. This relationship is steepened when more queuers ahead and when the the time is round number.

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115-1199 Improving Regularity of Care and Patient Outcomes: The Efficacy of Telemedicine Adoption.

Jane Iversen, Student, Ohio State University, United States  
Aravind Chandrasekaran, Professor, Ohio State University, United States

This work examines the association between a wide adoption of virtual visits and regularity of care and health outcomes for patients. Additionally, we look at how a potential reduction in patient no-shows and appointment wait times, and an increase in visit frequencies, mediate that relationship.

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### Contributed Session

433	Wednesday, 04:30 PM - 06:00 PM, Celebration 4	Track: Healthcare Operations Management
	Contributed Session: Transportation and Logistics for Healthcare	
	Chair(s): Debadyuti Das	

115-0059 Optimizing Non-emergency Medical Transportation Service

Xing HE, Student, College of Business, Hong Kong, China  
Shaochong Lin, Post Doc/Researcher, University of Hong Kong, Hong Kong, China  
Yanzhi Li, Professor, City University of Hong Kong, Hong Kong, China  
Yunqiang Yin, Professor, University of Electronic Science and Technology of China, China

Motivated by real challenges faced by a non-government organization in Hong Kong that provides transportation services for the disabled and elderly people, we study a selective dial-a-ride problem with uncertain traveling time and provided a new coherent risk index: the mean-variance risk index to deal with the uncertainty.

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115-1357 The route to specialized healthcare: Heterogeneous fleet planning using simulation models

Joelle Cormier, Student, HEC Montréal, Canada  
Valérie Bélanger, Associate Professor, HEC Montréal, Canada  
Marie-Eve Rancourt, Associate Professor, HEC Montréal, Canada

Real data input and simulation modelling were used to determine the size and composition of a heterogeneous fleet of fixed-wing aircraft in Québec, Canada. The results offer concrete recommendations and sheds light on the key trade-offs in the strategic and operational functioning of an aerial interhospital evacuation service.

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115-2095 Distribution Network Design in Public Health for Essential Medicines: An Investigation

Rahul Kumar, Student, University of Delhi, India  
Debadyuti Das, Professor, University of Delhi, India

## Wednesday, 04:30 PM - 06:00 PM

The present work involves investigating different modes of Public Health DistributionNetwork (PHDN) Design for essential medicines in two Indian States in terms of servicelevel, cost and carbon footprint. The findings reveal that different modes of PHDNs generateinteresting results in the three parameters which provide rich managerial insights.

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### Invited Session

434	Wednesday, 04:30 PM - 06:00 PM, Celebration 5	Track: Healthcare Analytics
	Invited Session: Vaccination policies in pandemics	
	Chair(s): Miao Bai Cuihong Li	

115-0136 Optimal Vaccination Rollout Policy

Puyao Ge, Student, University of North Carolina at Chapel Hill, United States  
Vidyadhar Kulkarni, Professor, University of North Carolina Chapel Hill, United States  
Jayashankar Swaminathan, Professor, University of North Carolina Chapel Hill, United States

We consider how to schedule the release of limited vaccine supply to several distinct groups within a finite population with different utility for the vaccine. We obtain the structural results of the optimal policies and show that these policies are applicable to several other situations such as online sales.

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115-0138 Optimal Scheduling and Capacity Planning of Two-Dose Vaccination Roll Out

Chaithanya Bandi, Associate Professor, National University of Singapore, Singapore  
Yini Gao, Assistant Professor, Singapore Management University, Singapore  
Rajeeva Moorthy, Post Doc/Researcher, National University of Singapore, Singapore  
Kelvin Tan, Director of Future Systems Office, Other, Singapore  
Chung-Piaw Teo, Professor, National University of Singapore, Singapore

Designing an effective COVID-19 vaccine rollout policy is pivotal to achieving a high vaccination rate. The paper presents operational frameworks to synchronize vaccine supply and demand for two-dose vaccination programs via appointment scheduling and vaccine center capacity planning. The frameworks are used to assist the Singapore Ministry of Health.

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115-0713 First Dose or Second Dose? A Study of Vaccination Policy with Supply and Capacity Constraints

Miao Bai, Assistant Professor, University of Connecticut, United States  
George Chen, Assistant Professor, London Business School, United Kingdom  
Cuihong Li, Professor, University of Connecticut, United States

We study the problem of allocating limited vaccine supply over time between first-dose and second-dose usage with vaccine administration capacity constraints. Based on the stylized SIR model, our analytical and numerical results establish the value of strategic delay and prioritizing second-dose usage before switching to prioritizing first-dose usage.

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### Contributed Session

437	Wednesday, 04:30 PM - 06:00 PM, Celebration 8	Track: Sustainable Operations Management
	Contributed Session: Sustainable Transportation with Electric Vehicles and Beyond	
	Chair(s): QIDI WU	

115-0403 Location and capacity allocation model for the electric vehicle charging stations' network planning in UK

QIDI WU, Student, Durham University Business School, Great Britain  
manish shukla, Assistant Professor, Duke University Durham, United Kingdom

To encourage the EV uptake by deploying the charging station system strategically, the facility location model of fast charging stations constructed in this study comprehensively considers various factors, such as charging demand, investment cost, EV owners' characteristics, and comprehensively reflects the problems of installing charging infrastructure.

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115-0593 Modeling of Electric Vehicle Battery Degradation with Deep Learning

Yixin Zhao, Student, University of Florida, United States  
Sara Behdad, Associate Professor, University of Florida, United States

Electric vehicle (EV) battery in-service status prediction is critical to prevent hazardous events. This paper presents the implementation of an LSTM-based approach to predict EV battery state of health and remaining useful life. The performance of the proposed model is compared with existing data-driven approaches.

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115-2023 How to improve resale value retention ability of Internal Combustion Engine Vehicles? Evidence from CarGurus.com

Tiep Nguyen, Student, Greenwich Business School, United Kingdom  
Li Zhou, Professor, Greenwich Business School, United Kingdom  
Quang (James) Huy Duong, Lecturer, Greenwich Business School, United Kingdom

While electric vehicles are being promoted globally, Internal Combustion Engine Vehicles (ICEVs) will still be around for many decades. To minimise its environmental impacts, circular economy approaches such as physical lifetime extension are crucial. This research explores how manufacturers can extend ICEVs lifetime through improving their resale value retention ability.

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## Wednesday, 04:30 PM - 06:00 PM

### Contributed Session

438

Wednesday, 04:30 PM - 06:00 PM, Celebration 9

Track: Supply Chain Management

Contributed Session: Supply Chain Network Design

Chair(s): Mihalis Giannakis

115-1033 Designing Resilient Logistics Networks Using k-Shortest Paths

Onkar Kulkarni, Student, Georgia Institute of Technology, United States

Mathieu Dahan, Assistant Professor, Georgia Institute of Technology, United States

Benoit Montreuil, Professor, Georgia Institute of Technology, United States

We consider the problem of designing resilient logistics networks by selecting hub locations to minimize the total demand-weighted distance of the k-shortest paths between each origin-destination pair. We leverage its structure to devise tailored solution methodologies based on Benders decomposition and branch-and-price, which we test on large-scale real-world parcel-delivery networks.

115-1568 Value of Information Analysis for Supply Chain Network Design Under Uncertainty

Austin Saragih, Student, Massachusetts Institute of Technology, United States

Milena Janjevic, Post Doc/Researcher, Massachusetts Institute of Technology, United States

Matthias Winkenbach, Assistant Professor, Massachusetts Institute of Technology, United States

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

Gilberto Montibeller, Professor, Loughborough University, United Kingdom

We present a framework and implementation of value of information (VOI) analysis for supply chain network design (SCND) under uncertainty. Specifically, we formulate an optimal information gathering strategy for decision-makers to prioritize the crucial segments of their supply chain. Based on results, we show significant value in partial information gathering.

115-1938 Designing Reverse Supply Chain Networks with Returned Product Quality Control

Sahar Ebrahimi Bajgani, Student, Worcester Polytechnic Institute, United States

Sara Saberi, Assistant Professor, Worcester Polytechnic Institute, United States

Fuminori Toyasaki, Associate Professor, York University, Canada

Aiming to determine the minimum acceptable quality of returned products for remanufacturing in different pandemic scenarios, we propose a reverse supply chain model with collection, remanufacturing, and recycling centers. We also evaluate the impact of technology acquisition by remanufacturing centers considering possible information leakage and free riding impact accordingly.

115-2108 The Effect of Supply Chain Distance on Enterprise Innovation Output

Mihalis Giannakis, Professor, Audencia Business School, France

We show how supply chain distance negatively impacts the innovation output and how risk-taking and information asymmetry play a mediating role. We use panel data of Chinese A-share listed companies from 2009-2022. The effects are more profound in non-state-owned businesses, in SMEs, and where the supply chain concentration is high.

### Contributed Session

439

Wednesday, 04:30 PM - 06:00 PM, Celebration 10

Track: Supply Chain Management

Contributed Session: Supply Chain and Digitization

Chair(s): Sherwat Ibrahim

115-1229 The Impact of Digital Transformation on Triple-A Supply Chain Performance

Graça Silva, Assistant Professor, ISEG- University of Lisbon, Portugal

Paulo Gomes, Assistant Professor, Florida International University, United States

Analysis of data from manufacturing firms is used to test the mediating role of Triple-A capabilities (agility, adaptability, and alignment) on the relationship between Industry 4.0 and supply chain performance and resilience. Results reveal differentiated impacts of Industry 4.0 adoption on Triple-A capabilities and dimensions of supply chain performance.

115-1318 Re-inventing the Supply Chains through Digital Transformation

Orkun Baycik, Assistant Professor, Boston University, United States

Shimon Gowda, Supply Chain Consultant, N/A, India

This study summarizes the current trends in operations and supply chain management through literature review and industry collaborations. We present how organizations can start their digital transformation journey and make progress if already started. Survey responses from industry experts help understand the key benefits of this transformation for organizations.

115-1721 how does Digital Operations capability enhance supply chain value creation?

Nathaniel Boso, Professor, Kwame Nkrumah University of Science and Technology, Ghana

Henry Mensah, Professor, Kwame Nkrumah University of Science and Technology, Ghana

Dominic Essuman, Lecturer, Sheffield University, United Kingdom

Dorcas Nuertey, Senior Lecturer, Kwame Nkrumah University of Science and Technology, Ghana

Grace Anansewaa Annan, Student, Kwame Nkrumah University of Science and Technology, Ghana

## Wednesday, 04:30 PM - 06:00 PM

Empirical examinations of the relationship between Digital transformation and social value have been of interest to some researchers. Yet little is known about how such relationship manifest. This study develops a mediated moderated model to explain how digital transformation can be leveraged for social value creation.

115-1949 Digital Supply Chain: A Critical Review

Binshan Lin, Professor, Louisiana State University Shreveport, United States

This study uses bibliometric software to identify research hotspots, topic evolution paths, and digital supply chain development trends. The results are analyzed and the evolution of the digital supply chain study follows incubation, exploration, and transition stages. Managerial implications and future research opportunities will be presented as well.

### Invited Session

440	Wednesday, 04:30 PM - 06:00 PM, Celebration 11	Track: Manufacturing Operations
	Invited Session: Platform Economics	
	Chair(s): Shivam Gupta Like Bu	

115-0046 Procurement for Assembly Systems under Disruption Risk: Optimal Mechanisms

Like Bu, Student, University of Texas at Dallas, United States

Milind Dawande, Professor, University of Texas Dallas, United States

Ganesh Janakiraman, Professor, University of Texas Dallas, United States

A manufacturer procures the components of an assembly system. For each component, the buyer has access to a supplier whose production cost is private, input effort is unobservable, and production yield is uncertain. We develop an optimal mechanism and offer practically convenient screening implementations of our optimal mechanism.

115-1197 Social Learning With Polarized Preferences On Content Platforms

Dongwook Shin, Assistant Professor, Hong Kong University of Science and Technology, Hong Kong, China

Bharadwaj Kadiyala, Assistant Professor, University of Utah, United States

Several socioeconomic and political issues attract polarizing beliefs in the society. We study the impact of such beliefs on content consumption and production on a platform. We find a social learning (SL) mechanism can mislead consumers to incorrectly perceive low-quality content to be of higher quality and investigate its implications.

115-1290 Could the implementation of Additive Manufacturing mitigate the trade-off between lean and agile practices?

Di Li, Senior Lecturer, University of Warwick, United Kingdom

Ruoqi Geng, Senior Lecturer, Cardiff Business School, United Kingdom

Linan Luo, Student, University of Warwick, United Kingdom

John Bancroft, Senior Lecturer, Oxford Brookes University, United Kingdom

Additive Manufacturing has been widely implemented in industries and argued to could revolute the manufacturing process and system for positive impacts. This paper aims to investigate whether the Additive Manufacturing implementation could mitigate the trade-off between lean and agile practices, to simultaneously improve both of them and ultimately enhance performances.

115-1632 Minimum Wage Regulation in Ride-Hailing Platforms: Unintended Spatial Equity Consequences

Harish Guda, Assistant Professor, Arizona State University, United States

Ashish Kabra, Assistant Professor, University of Maryland, United States

Several large cities have proposed various regulations to improve the effective pay for drivers on ride-hailing platforms. Of these, the most popular form of regulation is a utilization-adjusted minimum wage. We analyze the implications of such a minimum wage in a spatially-dispersed market.

### Contributed Session

441	Wednesday, 04:30 PM - 06:00 PM, Celebration 12	Track: Humanitarian Operations and Crisis Management
	Contributed Session: Disaster Relief Orientation	
	Chair(s): Dehai Liu	

115-0071 Topping modeling for generating knowledge

Mariana Moyano, Student, Universidad del Pacifico, Peru

Irineu Brito Jr, Professor, Universidade Estadual Paulista Julio De Mesquita Filho - Unesp, Brazil

Rafael Renteria, Assistant Professor, University of South Carolina Aiken, Colombia

Ana Luna, Professor, Universidad del Pacifico, Brazil

Mario Chong, Professor, Universidad del Pacifico, Brazil

This research analyzes more than 32,000 papers using topic modeling, an exploratory machine-learning technique. The results are nine main topics complemented with data visualization associated with a specific topic domain and present a novelty tool for the researcher to focus on the state-of-the-art and open the space to generate knowledge

115-1403 CONFIGURING SOCIAL-ECOLOGICAL RESOURCES OF HUMANITARIAN ORGANIZATIONS: WHEN DOES SUPPLY CHAIN COLLABORATION IMPROVE DISASTER RESPONSIVENESS

PRISCILLA ADDO ASAMANY, Student, KNUST SCHOOL OF BUSINESS, Ghana

## Wednesday, 04:30 PM - 06:00 PM

The contingency and social perspectives of the Resource Based View (RBV) theory is used to argue that similarity to ideal configuration of social-ecological resources greatly contributes to disaster responsiveness of Humanitarian organizations and that at different levels of Supply Chain Collaboration, the relationship is strengthened.

115-1520 How to Alleviate the Double Water Crisis of Drought-flood Disaster and Pollution in Transnational River

Dehai Liu, Professor, Dongbei University of Finance and Economics, China

Ruirui Chai, Assistant Professor, North China University of Water Resources and Electric Power, China

To effectively alleviate the above double water crisis with the long-term, dynamic and seasonal characteristics, we propose a differential game framework of the water resources crisis management between the upstream and the downstream countries, and then discuss a real-world case of Lancang-Mekong River Basin. We solve the optimal seasonal allocation.

115-1715 Panic Buying behavior analysis according to consumer income and product type during the pandemic

Irineu Brito Jr, Professor, Universidade Estadual Paulista Julio De Mesquita Filho - Unesp, Brazil

Flaviane Saraiva, Student, University of Sao Paulo, Brazil

Nathan Bruno, Student, Universidade Estadual Paulista Julio De Mesquita Filho - Unesp, Brazil

Celso Hino, Post Doc/Researcher, São Paulo University, Brazil

Roberto Fray Da Silva, Post Doc/Researcher, Universidade De Sao Paulo, Brazil

Just before measures, such as social distancing, quarantine, lockdowns, and internal movement restrictions, people began to buy in panic. This study shows that sales before, during, and after the panic buying period vary according to the product type and increase according to the average per capita income of the region.

### Contributed Session

442	Wednesday, 04:30 PM - 06:00 PM, Celebration 13	Track: Humanitarian Operations and Crisis Management
	Contributed Session: <b>Funding</b>	
	Chair(s): Tharcisio Fontainha	

115-0816 Humanitarian donors' fund allocation decision: impact of uncertainty, risk-aversion and intermediary bias

Bengisu Uurlu, Student, INSEAD, France

Atalay Atasu, Professor, INSEAD, France

Antoine Desir, Assistant Professor, INSEAD, France

Luk Van Wassenhove, Professor, INSEAD, France

Donors exhibit risk-aversion in funding humanitarian organizations (HOs) due to lack of information about the capabilities of HOs on the ground. In turn, donations are funnelled through intermediaries (e.g. UN agencies) who possess better field information but may have biased-preferences. We explain how optimal fund allocation depends on these trade-offs

115-0826 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

Laura Turrini, Associate Professor, European Business School, Germany

Alfonso Pedraza, Professor, Indiana University, United States

We study how firms' social investments affect their operational performance and the ongoing conflict in war-torn regions. With data from Colombia's oil industry and a difference-in-differences analysis, we show that social investments boost firms' operating margins—especially in less conflict-intense areas—without increasing conflict intensity.

115-0933 Dynamic bargaining on endogenous earmarked donation proportion

Ning Zhao, Associate Professor, Dongbei University of Finance & Economics, China

Dehai Liu, Professor, Dongbei University of Finance and Economics, China

The paper puts forward two fundraising modes on earmarked donation: emergency management department unilateral decision making and negotiation with social forces respectively. The result shows that Whether government departments need to negotiate to decide the proportion of earmarked donations depends on the time preference of both parties.

115-1013 Natural Disaster Insurance and Finance: challenges and opportunities for its adoption in the Brazilian context

Cassio Maduro, Student, Federal University of Rio De Janeiro, Brazil

Tharcisio Fontainha, Professor, Federal University of Rio De Janeiro, Brazil

Natural Disaster Insurance and Finance (DRIF) has great potential in disaster risk management. Thus, this research aims to analyze the opportunities and challenges of adopting DRIF. The case study considers World Bank and Brazilian stakeholders' perspectives, revealing the importance of engaging different stakeholders and technical methodologies for appropriate insurance pricing.

### Contributed Session

443	Wednesday, 04:30 PM - 06:00 PM, Celebration 14	Track: Service Operations
	Contributed Session: <b>Service Channels</b>	
	Chair(s): Sajeev George	

115-0047 Omnichannel Solution Applied in Customer Service Channels of a Financial Institution in Brazil.

Gabriela de Paula Ribeiro, Lecturer, Universidade Presbiteriana Mackenzie, Brazil

## Wednesday, 04:30 PM - 06:00 PM

ALEXANDRE CAPPELLOZZA, Assistant Professor, Mackenzie Presbyterian University, Brazil

This study presents a solution to the problem of low operational efficiency in the service channels of a relevant Brazilian financial institution. The initiative started the digital transformation of the organization's service channels and spread the institutional concern that all customers, regardless of the point of contact, experience successful journeys.

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115-0624 Digitizing retail banking services: An empirical examination of the drivers and outcomes of digitization capability

Ting Cao, Assistant Professor, Niagara University, Canada  
Murat Kristal, Associate Professor, York University, Canada  
M Rungtusanatham, Professor, York University, Canada  
Joy Field, Associate Professor, Boston College, United States

We study the digitization of retail banking services in retail banks and credit unions. We leverage the operations strategy framework and propose a theoretical model to examine the drivers and outcomes of elevating digitization capability. Both primary and secondary data are collected to test our model empirically.

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115-1528 Understanding Ordering Patterns at Franchise Restaurants

Jaewoo Lee, Student, University of South Carolina, United States  
Keith Skowronski, Associate Professor, University of South Carolina, United States  
Joel Wooten, Associate Professor, University of South Carolina, United States  
Sean Handley, Professor, University of South Carolina, United States

In this study, we investigate the inventory ordering patterns of restaurant franchisees using a proprietary dataset. We study the heterogeneity in ordering patterns across franchisee locations to understand drivers of overage and underage costs for a key ingredient throughout the network of franchisees

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115-1951 General and Health Insurance Service Providers of India: An Analysis of their Performance and Benchmarking

Sajeev George, Professor, S P Jain Inst. of Management & Research, India  
Sapna Malya, Associate Professor, SPJIMR, India

This research study attempts to benchmark the performance of the major general and health insurance firms of India in the private sector. A Data Envelopment Analysis (DEA) approach is used to analyze the production, investment and capital allocation efficiencies of these firms to derive useful managerial and academic insights.

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### Contributed Session

444	Wednesday, 04:30 PM - 06:00 PM, Celebration 15	Track: Information Systems and Operations Management
	Contributed Session: Digital Economy	
	Chair(s): Anurag Tewari	

115-1142 Digital Governance in Healthcare Sector

Karuna Jain, Professor, Indian Institute of Technology Bombay, India  
mahak sharma, Assistant Professor, BIMTECH, India

The study explores factors that impact digitalization governance in the healthcare sector. This study uses an integrated AHP-ISM-DEMATEL approach to find relative ranks, system actuators, and causality among the identified factors. "Data Privacy Risks" and "Government Policy and Regulations" are most critical impediments that also fall under the cause-effect group

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115-1450 The Application of Digital Twins in Supply Chain Management

Xavier Brusset, Professor, SKEMA, France  
Matthew Drake, Associate Professor, Duquesne University, United States  
Dmitry Ivanov, Associate Professor, Berlin School of Economics and Law, Germany  
Aseem Kinra, Associate Professor, Uni Bremen, Germany  
Mehrdokht (Medo) Pournader, Senior Lecturer, Melbourne University, Australia

Organizations continue to develop innovative methods for helping managers to make data-driven decisions. Using analytical tools, digital twins powerfully enhance decision reach and outcomes. Based upon a review of literature, we present a framework through which operations management initiatives that account for human frailty and biases can be targeted.

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115-1967 Virtual Factory Based Shop Floor Scheduling: An Application for a Semi Automated Manufacturing Environment

Anurag Tewari, Assistant Professor, University of Washington Bothell, United States  
Aastha Sharma, MBA, Indian Institute of Management Ahmedabad, India  
Aadish Jain, Partner, Shreyans Apparels, India  
Pavan Godiawala, Professor, National Institute of Fashion Technology, Kharghar, Navi Mumbai, India

Virtual factory simulations are often used in manufacturing for resourcing and scheduling. However, these are difficult to implement in a semi-automated environment. By combining automated and non-automated process data for an apparel manufacturer, we demonstrate a novel statistical methodology to design and execute a digital twin that improves planning decisions.

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## Wednesday, 04:30 PM - 06:00 PM

### Invited Session

445	Wednesday, 04:30 PM - 06:00 PM, Coral Spring 1	Track: Emerging Topics in Operations Management
	Invited Session: Emerging Topics in Behavioral and Retail Operations	
	Chair(s): Chengzhang Li	

115-0087 Help and Hagggle: Boosting Social Reach Through Randomized, Adaptive, All-or-Nothing Discounts

Chen Jin, Assistant Professor, National University of Singapore, Singapore  
Luyi Yang, Assistant Professor, University of California Berkeley, United States  
Zhen Shao, Student, University of Science and Technology of China, United States

This paper studies a novel social e-commerce practice known as "help-and-hagggle," we analyze help-and-hagggle using a dynamic game-theoretic model that captures randomized, adaptive and all-or-nothing these three features. "Help-and-Hagggle" can lead to a wider social reach, a lower promotion expense, and a higher profit from product sales.

115-0233 Venture Deals: Sources of Leverage in Entrepreneur-Investor Bargaining

Evgeny Kagan, Assistant Professor, Carey Business School, United States  
Kyle Hyndman, Professor, University of Texas Dallas, United States  
Anyan Qi, Assistant Professor, University of Texas Dallas, United States

We study equity division between an entrepreneur and one or more potential investors. The investor(s) and the entrepreneur negotiate how much equity (ownership) in the startup the investor(s) should receive in exchange for their investment.

115-0495 A Model of Livestream Selling with Online Influencers

Jing Hou, Student, Nanjing University, China  
Houcai Shen, Professor, Nanjing University, China  
Fasheng Xu, Assistant Professor, Syracuse University, United States

As the usage of livestreaming as a shopping channel skyrocketed during Covid-19 lockdowns, numerous brands started to leverage livestream selling to drive sales. We develop a game-theoretic model to investigate a firm's optimal livestream adoption strategies and implementation tactics and the implications of livestream adoption for influencers and consumers.

115-0808 Optimal Dynamic Mechanism under Customer Search

Zhenyu Hu, Associate Professor, National University of Singapore, Singapore  
Yangge xiao, Student, NUS Business School, Singapore

We consider a seller's revenue maximizing problem in face of a customer who searches for outside alternatives over a finite horizon. We show that it is optimal for the seller to offer a menu of American options comprising of a menu of deposits and strike prices.

### Contributed Session

446	Wednesday, 04:30 PM - 06:00 PM, Coral Spring 2	Track: Operational Excellence
	Contributed Session: Operational Excellence in resource management	
	Chair(s): Manpreet Hora	

115-0819 The effect of human resource allocation on knowledge intensive project performance

Antoaneta Momcheva, Assistant Professor, Stockholm School of Economics, Sweden  
Fabrizio Salvador, Professor, IE Business School, Spain  
Juan Madiedo, Associate Professor, Rotterdam School of Management, Netherlands

Front-loading has been shown to reduce risks and improve project performance. However, because of organizational constraints, front-loading is not always feasible. Using data from 253 R&D projects, we explore how different facets of familiarity of the project team supplement front-loading and ensure high performance, when the latter is limited.

115-1558 Multi-Treatment Forest Approach for Analyzing the Heterogeneous Effects

Minmin Zhang, Student, University of Texas at Dallas, United States  
Guihua Wang, Assistant Professor, University of Texas Dallas, United States  
Wallace Hopp, Professor, University of Michigan - Ann Arbor, United States  
Michael Mathis, Assistant Professor, University of Michigan Medical School, United States

By applying a newly developed approach called "MT forest" to examine the effect of team familiarity on surgery duration in a clinical setting, we find the effect of team familiarity is heterogeneous across patients.

115-1596 Project Managers' Traits and Performance: A Quasi-Experiment

Vijaya Sunder M, Assistant Professor, Indian School of Business, India  
Manpreet Hora, Associate Professor, Georgia Institute of Technology, United States

Collective project team identification, project outcomes and satisfaction among project team members are intrinsically related. However, these relationships vary with the project manager's characteristics like gender and origin (within or outside the firm). Through a quasi-experiment, we empirically examine these relationships in lean projects, a unique kind of short-duration micro-projects.

115-1745 Questioning Organizational Complexity: A Conceptual Framework for Scaling Operations



## Wednesday, 04:30 PM - 06:00 PM

Wiljeana Glover, Associate Professor, Babson College, United States

Scaling organizations face increasing organizational complexity. Extending cognitive approaches to complexity, I explore how an organization's conceptualization of complexity influences their ability to adjust complexity sources, i.e., states (products and services) and interdependencies. I present a framework of alternative scaling mechanisms (data, proximity, and processes) that may minimize complexity.

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### Invited Session

447	Wednesday, 04:30 PM - 06:00 PM, Blue Spring 1	Track: Supply Chain Risk Management
	Invited Session: <b>Nascent Initiatives and Innovations in iFORM</b>	
	Chair(s): Xin Geng      Guang Xiao	

115-0424 Coddle the Manufacturer or the Retailer: Government Loan Policy for Nascent Supply Chains

Jing Hou, Student, Nanjing University, China

Fasheng Xu, Assistant Professor, Syracuse University, United States

Omkar Palsule-Desai, Assistant Professor, Indian Institute of Management, Indore, India

Srinagesh Gavirneni, Professor, Cornell University, United States

In July 2021, the Government of India extended the scope of MSMEs (Micro, Small and Medium Enterprises) to encompass the retail and wholesale sector. This paper investigates how this government regulation change impacts the supply chain operations and profits, the government loss of capital, and the system welfare.

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115-0629 E-Tailing with Instant Return Credit

Rong Li, Associate Professor, Syracuse University, United States

Duo Shi, Assistant Professor, The Chinese Univ of Hong Kong, Shenzhen, China

Instant return credit (in short, return-credit) is a new FinTech service that offers a store credit immediately upon a return claim, without requiring the return to be received. We study whether or not and how retailers should adopt return-credit.

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115-0640 Innovation Against Imitation: Crowdfunding Strategy to Compete with Copycats

Zepeng Chen, Student, Hong Kong Polytechnic Univ, Hong Kong, China

Xiaomeng Guo, Associate Professor, Hong Kong Polytechnic Univ, Hong Kong, China

Guang Xiao, Associate Professor, Hong Kong Polytechnic Univ, Hong Kong, China

Fasheng Xu, Assistant Professor, Syracuse University, United States

Reward-based crowdfunding has experienced dramatic growth in recent years. However, crowdfunding is a double-edged sword. We employ a game-theoretical model where the startup can either choose the bank financing strategy and start the business activity without demand information or elect the crowdfunding strategy in the presence of potential imitation.

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115-1386 Returnless refund in online retailing operations

Amin Shahmardan, Student, McMaster University, Canada

Mahmut Parlar, Professor, McMaster University, Canada

Yun Zhou, Associate Professor, McMaster University, Canada

With returnless refund, customers may receive a full refund without returning the product. We assume that a fixed price and that the retailer may (deterministically or probabilistically) allow returnless refund. We show that granting returnless refund probabilistically may outperform the strategy that grants it on a case-by-case basis.

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### Invited Session

448	Wednesday, 04:30 PM - 06:00 PM, Blue Spring 2	Track: Supply Chain Risk Management
	Invited Session: <b>Emerging Topics in Supply Chain Management</b>	
	Chair(s): Junghee Lee	

115-0035 Swift Knowledge Transfer: New Supplier Development during Disruption in Supply

Rebecca Clemons, Associate Professor, Indiana University, United States

Results from a case study of automotive supply chain firms seeks to understand how these firms managed unexpected disruption in the supply base causing a loss of production. Specifically, what methods of communication were used to share information and quickly build trust between buyer and supplier?

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115-0700 Organizational learning from quality failure: product recalls and shortages

Hanu Tyagi, Student, University of Minnesota, United States

Junghee Lee, Assistant Professor, University of Notre Dame, United States

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

We explore the unintended consequences of quality failure operationalized as product recalls. Using publicly available secondary data, we explore the unintended consequences of product recalls on product shortages in the context of US pharmaceutical industry.

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115-1696 Big Data Analytics Capabilities and Supply Chain Resilience: The Role of Risk Management Compliance Strategy.

Enoch Bulley, Student, Kwame Nkrumah University of Science and Technology, Ghana

Francis Baidoo, Associate Professor, University of Texas Rio Grande Valley, United States

David Asamoah, Associate Professor, Kwame Nkrumah University of Science and Technology, Ghana

## Wednesday, 04:30 PM - 06:00 PM

John Marfo, Lecturer, Kwame Nkrumah University of Science and Technology, Ghana

Kwame Kwateng, Associate Professor, Kwame Nkrumah University of Science and Technology, Ghana

Resilience remains a topical issue amongst supply chains. Drawing on the dynamic capability theory, this study advances knowledge by examining the relationship between big data analytics capabilities and supply chain resilience. The findings demonstrate a positive mediation effect of risk management compliance strategy towards resilience in the big data environment.

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115-1975 Designing public vaccine procurement contracts to increase the supply of vaccines

Hongmei Sun, Post Doc/Researcher, York University, Canada

Fuminori Toyasaki, Associate Professor, York University, Canada

We design the optimal public procurement contracts to achieve the socially optimal level of vaccine supply when facing essential operational challenges, such as the need to establish manufacturing capacity before and after regulatory approval, the demand uncertainties, and the nonlinear values of vaccines in reducing the total number of infections.

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### Invited Session

449	Wednesday, 04:30 PM - 06:00 PM, Rainbow Spring 1	Track: Empirical Research in Operations Management
	Invited Session: Network and Its Implications on Operations Excellence	
	Chair(s): Yingchao Lan	

115-0476 Social network analysis and product performance

Yi-Su Chen, Associate Professor, University of Michigan-Dearborn, United States

Yuhong Li, Assistant Professor, Old Dominion University, United States

Kedong Chen, Assistant Professor, Old Dominion University, United States

Social network analysis such as centrality has been applied to detect firm performances. In this study, we return to the roots by examining individual centrality measures and their impacts on performance, contextualized in the booming board game industry, projected to reach US\$3.13 billion in 2022. We discuss managerial insights.

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115-0574 Restructuring the supply bases after M&As

Yang Yang, Associate Professor, University of Texas at El Paso, United States

Sangho Chae, Assistant Professor, Tilburg University, Netherlands

Tingting Yan, Associate Professor, Wayne State University, United States

Kevin Linderman, Professor, Penn State University, United States

While M&As cause initial changes in the firms' supply bases, how the supply bases continuously change after the M&As and how these changes affect the firms' operational excellence are largely unknown. This research provides some initial evidence to these research questions.

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115-0646 The dark side of operational excellence in networks

Paul Skilton, Associate Professor, Washington State University, United States

Because operational excellence implies the integration of intra- and inter-organizational systems to reduce cost, waste and redundancy, it is inherently a network concept. This study examines the dark side of operational excellence in networks, including limitations on value creation, restrictions of knowledge flows and entrapment in local optima.

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115-0975 Supply Network Complexity, Regulatory Risk and Firms' Engagement in Influencing Climate Change Policies

Zhenzhen Yan, Assistant Professor, Idaho State University, United States

Sriram Narayanan, Professor, Michigan State University, United States

Tobias Schoenherr, Professor, Michigan State University, United States

To enhance organizational legitimacy and competitive advantages, many firms have strived to go beyond policy compliance and engage in influencing the climate change policies (EICCP). Our research examines the regulatory risks associated with climate change and firms' supply network complexity as critical and interrelated factors for firms' EICCP.

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### Invited Session

450	Wednesday, 04:30 PM - 06:00 PM, Rainbow Spring 2	Track: Operational Excellence
	Invited Session: Achieving Non-Profit Operational Excellence	
	Chair(s): Yingru Han	

115-0115 Improving the Quality of In-kind Donations: A Natural Field Experiment

Sindy Pacheco, Director of Design & Data Analytics, The Society of Saint Vincent de Paul, Arizona, United States

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

Chao Wu, Student, Arizona State University, United States

While in-kind donations contribute to triple bottom line, low-quality items impose additional costs to sort, process, or discard them. Minimizing the amount of undesired donations is a challenge given charities' sensitive relationship with their donors. We used behavioral intervention to improve quality in a natural field experiment.

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115-0652 Achieving Resilience to Disruptions in Food Banks through Redundancy Building

Luv Sharma, Associate Professor, University of South Carolina, United States

Yingru Han, Student, University of South Carolina, United States

## Wednesday, 04:30 PM - 06:00 PM

Olga Perdikaki, Associate Professor, University of South Carolina, United States

Pelin Pekgun, Associate Professor, University of South Carolina, United States

In this study, we investigate the role of a critical operational factor in influencing the ramp-up in distributional capacity for food banks in the face of emergencies like the Covid-19 pandemic and help build resiliency in operations.

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115-1835 Behavioral Responses To Nonprofit Performance Metrics: Efficiency Vs. Impact

Hasti Rahemi, Student, University of Colorado Boulder, United States

Gloria Urrea, Assistant Professor, University of Colorado Boulder, United States

Leon Valdes, Assistant Professor, University of Pittsburgh, United States

Among NPO performance metrics, the program spending ratio- the percentage of an NPO's expenditures that goes to its programs - is pervasive. However, heavily relying on PSR might do more harm than good. We study whether and how NPOs can use other metrics to reduce their reliance on PSR.

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### Invited Session

451	Wednesday, 04:30 PM - 06:00 PM, Barrel Spring 1	Track: POM-Marketing Interface
	Invited Session: Marketing and Operations Strategies in Compensation, Certification, Return, and Demand Manage	
	Chair(s): Mabel C. Chou	

115-1784 What Moves The Customers? Adoption of Self-service Technology in the Last Mile

Libo Sun, Post Doc/Researcher, University of Science and Technology of China & National University of Singapore, Singapore

Guodong Lyu, Assistant Professor, Hong Kong University of Science and Technology, China

Chung-Piaw Teo, Professor, National University of Singapore, Singapore

To comprehensively understand how customers can be nudged to adopt self-service parcel lockers, this paper empirically identifies two effects in this problem: exposure effect (how locker usage changes after a first trial) and popularity effect (how usage is influenced by the popularity of parcel lockers installed in the vicinity)

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115-1791 Good Corp and Bad Corp: An Economic Analysis of Certification

Guowei Liu, Associate Professor, Hebei University of Technology, China

Jiong Sun, Associate Professor, Purdue University, United States

Jianxiong Zhang, Professor, Tianjin University, China

This paper investigates the economic impacts of certifying a new form of businesses that pursue a dual mission, profit and social good. We find that consumer heterogeneity has a non-monotonic impact on the firm's ability to separate itself from the conventional for-profit firm and that certification may hurt the consumer.

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115-1855 Adopting buy online return in-store or not? Considering competing firms selling substitute products

Guiyang Zhu, Post Doc/Researcher, National University of Singapore, China

Mabel C. Chou, Associate Professor, National University of Singapore, Singapore

When a traditional retailer and an e-tailer sell substitute products and compete in price, we analyze whether and when these two retailers would collaborate to allow consumers to buy online and return in-store (i.e., BORS). We derive conditions under which BORS can increase demand and reduce return handling cost.

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115-1872 Taming the Long Tail: Gambler's Fallacy in Intermittent Demand Management

Sheng Bi, Assistant Professor, Shanghai University of Finance and Economics, China

Long He, Assistant Professor, National University of Singapore, Singapore

Chung-Piaw Teo, Professor, National University of Singapore, Singapore

Our analysis is motivated by a recent interesting observation that gambler's fallacy holds in a finite number of coin tosses. We use it to analyze the inventory problem for intermittent demand to demonstrate that some classical models must bias the underlying demand distribution to account for the finite horizon.

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### Invited Session

452	Wednesday, 04:30 PM - 06:00 PM, Barrel Spring 2	Track: Procurement and Supplier Management
	Invited Session: Sourcing and Resilience Strategies in Pharmaceutical Supply Chains	
	Chair(s): Jagjit Srani Ettore Settanni	

115-0588 Serendipity of Sustainable Pharmaceutical Procurement: Finding Transparency When You Were Least Expecting It

Marianne Jahre, Professor, BI Norwegian Business School, Norway

Kim Van Oorschot, Professor, BI Norwegian Business School, Norway

Mikal S. Pettersen, , ,

Eirik Sverrisson, , ,

Wangen Andreas, , ,

Christine Årdal, Senior Adviser, Norwegian Institute of Public Health, Norway

The paper reports on one of the first attempts to use environmental criteria in procurement of pharmaceuticals and finds that applying such criteria not only improves the environmental dimension of sustainability, but also creates greater transparency, thereby allowing for proactive interventions to prevent shortages.

## Wednesday, 04:30 PM - 06:00 PM

- 115-1778 How Do Drug Shortages Affect FDA's Drug Inspections? An Empirical Study  
Ziheng (Archie) Zhuang, Student, Penn State University University Park, United States  
In Joon Noh, Assistant Professor, Penn State University, United States  
Hui Zhao, Associate Professor, Penn State University University Park, United States

Drug shortages have been a significant and persistent challenge in the U.S. Some drug manufacturers blame FDA for the production delay and resultant shortages, claiming that FDA's inspections tend to be unnecessarily stringent. Given these anecdotes, we empirically investigate the impact of drug shortages on FDA's drug inspections.

- 115-1882 B2B digital platform interventions in medicines supply chains: exploring the potential for value creation  
Ettore Settanni, Post Doc/Researcher, University of Cambridge, United Kingdom  
Jagjit Srail, Professor, University of Cambridge, United Kingdom  
Nitin Joglekar, Associate Professor, Questrom School of Business, United States

We apply a recently proposed value creation lens to evaluate targeted B2B platform interventions in medicines supply chains. These interventions aim at: (1) facilitating interaction between medical device manufactures and direct-to-home healthcare providers; and (2) enabling the release by exception of inbound inventory within a highly regulated Quality Assurance process.

### Invited Session

453	Wednesday, 04:30 PM - 06:00 PM, Rock Spring	Track: POM-Economics Interface
	Invited Session: Operations, Market(ing), and Economics	
	Chair(s): Haokun Du	

- 115-0429 Competitive Markovian Pricing  
Haokun Du, Student, The University of Texas at Dallas, United States  
Bin Hu, Associate Professor, Naveen Jindal School of Management, United States  
Elena Katok, Professor, University of Texas Dallas, United States

Dynamic pricing is complicated by strategic revenue management. A remedy to it is Markovian pricing under monopolistic setting. We consider competitive Markovian pricing and show that competition may increase retailer profits and price-matching may decrease retailer profits. Further discussions on these counterintuitive results are given.

- 115-0849 Rollover under Subscription Programs  
Jin Miao, Student, The University of Texas at Dallas, United States  
Haokun Du, Student, The University of Texas at Dallas, United States

As subscription programs have become increasingly popular, retailers need to decide whether to allow unused amounts in one period to be rolled over to the next period. This study examines consumer inventory management, as well as the impact of rollover allowance on pricing, profits, consumer welfare and social welfare.

- 115-1173 Multidimensional Procurement Auction with Loss-Averse Workers in Online Labor Markets  
Jason Wu, Post Doc/Researcher, University of Houston, United States  
Shan Li, Assistant Professor, Baruch College, United States  
Kay Yut Chen, Professor, University of Texas Arlington, United States

Service procurement auction involving multidimensional bids - typically a proposal and a price - are ubiquitous in online labor markets. Intuitively, loss aversion is important to our setting particularly. We study the impact of loss aversion and design mechanism to improve welfare under the effect of loss aversion.

- 115-1515 Inside the Subscription Box: Product Line Design with Consumer Habituation  
Dawei Jian, Student, University of California Riverside, United States

The rise of personalized subscriptions transformed retail markets. How should a firm learn consumer's evolving tastes and personalize product offerings? We study this dynamic product line design problem where consumer's tastes are evolving stochastically driven by habituation. Our results explain rising popularities of personalized subscription and improve practices.

### Invited Session

454	Wednesday, 04:30 PM - 06:00 PM, Regency Ballroom Q	Track: Revenue Management and Pricing
	Invited Session: Recent Advances in Data-Driven Inventory and Revenue Management	
	Chair(s): Divya Singhvi	

- 115-1216 Learning Inventory Control Policies with Fixed Ordering Costs  
Xiaoyu Fan, Student, New York University, United States

We study the multi-stage stochastic inventory control with fixed ordering costs under unknown demand distribution. We adopt sample average approximation to learn the optimal policy. We show that it only requires a polynomial-sized set of samples to obtain a provably near-optimal solution with high probability.

- 115-1323 End-to-End Learning for Optimization via Constraint-Enforcing Approximators  
Rares Cristian, Student, Massachusetts Institute of Technology, United States  
Pavithra Harsha, Research Staff Member, IBM, United States

## Wednesday, 04:30 PM - 06:00 PM

Georgia Perakis, Professor, Massachusetts Institute of Technology, United States

Brian Quanz, Research Staff Member, IBM, United States

In many applications, including supply chain, predictions (for example, of demand) are used as inputs for downstream optimization tasks. An example includes determining a fulfillment strategy. We present a computationally efficient neural network architecture approximating solutions to such optimization problems letting us learn forecasts that minimize the final task-based objective.

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### Contributed Session

455	Wednesday, 04:30 PM - 06:00 PM, Regency Ballroom O	Track: Retail Operations
	Contributed Session: <b>Multichannel and Store profitability</b>	
	Chair(s): Christopher Mejia	

115-0801 In-store product planning of multichannel retailer with product-fit uncertainty and competition

Raunak Joshi, Student, Indian Institute of Management Calcutta, India

Sumanta Basu, Professor, Indian Institute of Management Calcutta, India

Sreelata Jonnalagedda, Associate Professor, Indian Institute of Management Bangalore, India

Balram Avittathur, Professor, Indian Institute of Management Calcutta, India

We address the problem of in-store assortment planning, service level determination and pricing when the product-fit is uncertain, and the multichannel retailer faces competition. The consumers have to decide whether to purchase based on online information or visit the store for verification, with uncertain product availability in store.

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115-0925 Dynamic Labour Allocation to Increase Store Profitability

Shandong Mou, Assistant Professor, Central University of Finance And Economics, China

David Robb, Professor, University of Auckland, New Zealand

Aligning staff with changing customer and store needs is critical in retail store operation management. We propose a dynamic labour allocation framework and utilize approximate dynamic programming techniques to provide good forward-looking solutions. The effectiveness of the proposed solutions is validated using extensive computational experiments.

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115-1410 The issue of consolidating customer orders in retail distribution centers: a multiple case study

JOAKIM KEMBRO, Associate Professor, Lund University, Sweden

Andreas Norrman, Professor, Lund University, Sweden

Ebba Eriksson, Post Doc/Researcher, Lund University, Sweden

As retail distribution centers are increasingly automated and grow in size to handle a wide range of products and flows, the issue of consolidating customer orders becomes critical. We investigate the consolidation issue through a multiple case study, offering both theoretical and practical insights on new technology, challenges, and solutions.

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115-1771 Consumer preferences on retailers for the food purchase in Sabana Centro, Colombia.

AGATHA DA SILVA OVANDO, Student, Universidad de la Sabana, Bolivia

Gonzalo Mejia, Associate Professor, Universidad De La Sabana, Colombia

Christopher Mejia-Argueta, Assistant Professor, Massachusetts Institute of Technology, United States

This study aims to represent the discrete choice of households in the Sabana Centro region of Colombia when selecting their preferred retail format to purchase food. To this, we applied a structured survey at the region, and used georeferenced data of households and retailers to generate a nested logit model.

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### Invited Session

456	Wednesday, 04:30 PM - 06:00 PM, Regency Ballroom P	Track: Disruptive Technologies and Operations Management
	Invited Session: <b>Platform Strategy</b>	
	Chair(s): Yeongin Kim Geng Sun	

115-1947 Marketplace or Logistics Provider: Extended MFS Programs in Online Retailing

Geng Sun, Assistant Professor, University of Texas Rio Grande Valley, United States

Huseyin Cavusoglu, Associate Professor, University of Texas at Dallas, United States

Srinivasan Raghunathan, Professor, The University of Texas at Dallas, United States

We study the emerging phenomenon that online platforms expand their membership-based free shipping programs to merchants running their own e-commerce websites, as opposed to listing on the marketplaces. We find that the external MFS revenue may well compensate the internal commission loss, which makes the platforms better off overall.

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115-1989 The Value of Blockchain Adoption in Social Media Platforms

Qiyuan Deng, Assistant Professor, Chinese Univ of Hong Kong (Shenzhen), China

Weilin Ye, Student, Chinese Univ of Hong Kong (Shenzhen), China

Chenglong Zhang, Assistant Professor, Chinese Univ of Hong Kong (Shenzhen), China

This study examines the implications of blockchain technology on piracy issues and compares it with traditional anti-piracy approaches. We identify when blockchain should be adopted and how it affects platforms, creators and second creators. Managerial implications are discussed.

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115-2122 An Empirical Analysis of an Online Freelance Home Services Platform and Burglary

## Wednesday, 04:30 PM - 06:00 PM

Doehun Kim, Student, Korea Advanced institute of Science and Technology, South Korea

Jiyong Park, Assistant Professor, The University of Georgia, United States

Chul Ho Lee, Assistant Professor, K A I S T, South Korea

Hangjung Zo, Professor, Korea Advanced institute of Science and Technology, South Korea

By exploiting a quasi-experimental setting of TaskRabbit's staggered entries into US cities, this study examines how an online freelance home services platform affects residential burglaries in the service locale. Our findings demonstrate that TaskRabbit's entry is negatively associated with the residential burglaries, particularly during the day rather than at night.

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### Invited Session

457	Wednesday, 04:30 PM - 06:00 PM, Silver Spring 1	Track: Data Science and Analytics
	Invited Session: Applications of Data Driven Modeling in Marketing and Operations	
	Chair(s): Sajeesh Sajeesh	

115-2081 : Using Text Analysis in Parallel Mediation Analysis

Judy Zhang, Student, Ohio State University, United States

Hongshuang (Alice) Li, Associate Professor, The Ohio State University, United States

Greg Allenby, Professor, Ohio State University, United States

Text data is widely used in marketing research. In this paper, we propose a model that use text data to identify multiple mediators in a parallel mediation analysis. Our model is based on the Latent Dirichlet Allocation (LDA) model that incorporates treatment and outcome variables.

115-2082 The More, the Merrier? Female Representation Across Management Levels and Product Recall Decisions and Outcomes

Vivek Astvansh, Assistant Professor, Indiana University Bloomington, United States

Anto Verghese, Assistant Professor, University of North Texas, United States

The authors test these arguments by measuring the effect of female representation at an automotive manufacturer's executive level (FREL) on the manufacturer's (1) number of voluntary vehicle recalls and (2) rate of completing the recalls by repairing the recalled vehicles. They find that FREL has an inverse-U shaped effect.

115-2083 The Value of External Data for Digital Platforms: Evidence from a Field Experiment

Xiaoxia Lei, Student, Shanghai Jiao Tong University, China

Yixing Chen, Student, University of Notre Dame, United States

Ananya Sen, Assistant Professor, Carnegie Mellon University, United States

Firms increasingly leverage external data with an aim to unlock improvements in products and services, but it is challenging to measure the value of external data. Collaborating with a large Chinese technology company, the authors analyze a randomized field experiment to measure the causal impact of external data.

115-2092 Impact of Obesity Policy Perceptions on Firms' Marketing Outcomes

Ece Baskol, Manager, ABC, Turkey

Sajeesh Sajeesh, Associate Professor, University of Nebraska Lincoln, United States

Ozgur Araz, Professor, University of Nebraska Lincoln, United States

Obesity has become a global epidemic. Firms also contribute to complexity with their food marketing initiatives. However, the effect of policies could be different for firms of different sizes, competitive intensity, and revenues. Therefore, we collect data using a survey to study variation in perceptions across managers from different firms.

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### Invited Session

458	Wednesday, 04:30 PM - 06:00 PM, Silver Spring 2	Track: Inventory and Logistics Management
	Invited Session: Distracted driving and technologies in Last Mile	
	Chair(s): Suman Niranjana Vipul Garg	

115-0715 Neutralization and Respect for Safety as Influences on Distracted Driving Behavior Among Young Adults

Janeth Gabaldon, Student, University of North Texas, United States

Suman Niranjana, Assistant Professor, University of North Texas, United States

Timothy Hawkins, Associate Professor, University of North Texas, United States

The study investigates how respect for safety, neutralization, and polychronicity contribute to the distracted driving behavior of young drivers. The framework is analyzed through the cognitive dissonance theory lens to explore cognitive human factor variables that increase or decrease engagement in the behavior followed by a post-hoc analysis driver's profile.

115-0732 Does Psychological and Physiological Characteristics of a Driver Impact Performance: A Driver Simulation Perspective

Suman Niranjana, Assistant Professor, University of North Texas, United States

Janeth Gabaldon, Student, University of North Texas, United States

Arunachalam Narayanan, Associate Professor, University of North Texas, United States

Vipul Garg, Student, University of North Texas, United States

brian sauser, Associate Professor, University of North Texas, United States

## Wednesday, 04:30 PM - 06:00 PM

The study is focused on determining if psychological factors such as personality, polychronic behavior, cognitive failure, task load, sleeplessness, and respect for safety influence driver performance. Additionally determine if the physiological factors such as emotional arousal, heart rate, cognitive load, and eye-tracking will help with predicting driver performance.

115-1685 Last Mile Delivery Aided by Drone: A Systematic Review of Literature and Research Directions

Vipul Garg, Student, University of North Texas, United States  
Suman Niranjana, Assistant Professor, University of North Texas, United States  
Terrance Pohlen, Professor, University of North Texas, United States  
Victor Prybutok, Professor, University of North Texas, United States  
David Gligor, Professor, University of North Texas, United States

Using drones, retailers hope to decrease delivery times and increase flexibility and velocity. In the literature, review studies are scarce, particularly those focusing on drone applications in the last mile. This study attempts a first step toward consolidating and providing a comprehensive view of drones by providing multiple frameworks.

115-1831 Blockchain-based Last Mile Delivery: Drivers of Trust amongst Retailer-Consumer-3PL Triad

Kiran Patil, Student, University of North Texas, United States

Most retailers in consumer goods have struggled to provide reliable last-mile delivery, particularly during the holiday season, despite technology-driven flexibility and convenience. This study contends that blockchain will reduce delivery struggles as downstream supply chain firms transition onto blockchain-based networks.

### Invited Session

459	Wednesday, 04:30 PM - 06:00 PM, Winter Park 49	Track: Product Innovation and Technology Management
	Invited Session: Product and Process Innovation	
	Chair(s): Mohsen Mosayebi	

115-0813 Emerging Product Regression of the Business Jet

Haruo Horaguchi, Professor, Hosei University, Japan  
Reiko Takenouchi, Professor, Seijo University, Japan  
Vidyaranya Gargeya, Professor, The University Of North Carolina At Greensboro, United States

The paper presents a comparative study of 7 different business jets (developed by 5 companies). The findings show that irrespective of location and company of origin, the customer requirements play a major role in the development of the product. Some propositions are presented for future research.

115-1282 Customer perceptions on product origin: Analysis of Amazon Reviews

Maneesh Reddy Ajjuguttu, Student, Clemson University, United States  
Ahmet Colak, Assistant Professor, Clemson University, United States  
Lawrence Fredendall, Professor, Clemson University, United States

Literature has established that learning the product origin information would change the customer perceptions towards the product. In this research, we study how the customers' on Amazon.com are affected when the product origin information is obtained from the reviews, specifically under conditions when the information is ambiguous.

115-1842 Sustainable Innovation and Operations Management: An Integrated Approach to Eastern and Western Philosophies

Mohsen Mosayebi, Assistant Professor, Georgia College & State University, United States  
Mehrnaz Khalaj Hedayati, Assistant Professor, Georgia College & State University, United States

Sustainable manufacturing companies as dynamic systems need to upgrade themselves. The eastern philosophy uses continuous improvement as internal innovation management system. The western philosophy uses R&D as source of external innovation. This paper presents a conceptual model of the combinational method using both internal and external innovation in operations management.