Sessions for Sunday, May 05

Sunday, 08:00 AM - 09:30 AM

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Sunday, 08:00 AM - 09:30 AM, Piscataway — Track: Energy Supply Chains

Invited Session: Energy Market Coordination and Analytics

Chair(s): Kai Pan

093-0367 Data-Driven Predictive Model for Residential Building Energy Optimization

Meysam Rabiee, Student, University of Oregon, United States
Shaya Sheikh, Assistant Professor, New York Institute of Technology, United States

We utilize a hybrid heuristic and data mining technique to develop an energy consumption and feature selection model for residential buildings. We use weather and energy consumption data from several zip codes in Austin, Texas to validate the predictive model. The presented approach can be extended to other climate zones.

093-0784 Death Spiral in Solar Power Markets

Fariba Farajbakhsh, Student, University of Texas Dallas, United States
Metin Cakanyildirim, Professor, University of Texas Dallas, United States

Higher solar power penetration is environmentally desirable, but can increase electricity prices. Having environmental and social responsibilities, regulators face challenges with setting prices. We provide a revenue maximization formulation to reveal the connection (death spiral) between rate increases and solar penetration, and extend this formulation to mitigate price increases.

093-1119 An Analytical Comparison of Electricity Market Designs in the Presence of Renewables

Yashar Ghiassi-Farrokhfal, Assistant Professor, Rotterdam School of Management, Netherlands
Rodrigo Crisostomo Pereira Belo, Associate Professor, Rotterdam School of Management, Netherlands
Mohammad-Reza Hesamzadeh, Associate Professor, Royal Institute of Technology (Kth), Sweden

Existing electricity markets are not designed to handle large scale unpredictability. Hence, their efficiency might extensively deteriorate as more solar/wind power is introduced. We formulate and analyze the impact of unpredictable power in the efficiency of several existing electricity markets. We further evaluate the best practices in improving the efficiency.

093-1161 Coordinating Energy and Ancillary Services Markets

Kai Pan, Assistant Professor, The Hong Kong Polytechnic University, Hong Kong

To ensure system reliability, ancillary services are introduced for power system operations to reserve certain generation capacities to accommodate uncertainties. In this talk, we propose an optimization model for system operators to efficiently schedule the generation assets, so as to coordinate power generation and ancillary services markets.

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Sunday, 08:00 AM - 09:30 AM, Northwest — Track: Information Systems and Operations Management

Contributed Session: IS applications for SCM problems

Chair(s): Francis Gleeson

093-0840 Influence of IOS Appropriation in Tourism Agility and Tourism Resilience Development: An Empirical Study

Santanu Mandal, Associate Professor, Amrita Vishwa Vidyapeetham, India

We explore the role of IOS use for communication, intelligence, integration, collaboration, and coordination in the development of tourism SC agility and resilience, and their inter-relationships. With responses from key tourism entities analyzed in SmartPLS 2.0.M3, we found IOS use for integration, collaboration, and coordination as chief enablers.

093-0021 Information Technology Offshoring Operations

Shantanu Banerjee, Manager, GAVS Technology, United Kingdom
Usha Ramanathan, Professor, Nottingham Business School, United Kingdom
Ramakrishnan Ramanathan, Professor, University of Bedfordshire, United Kingdom

The growing volume of offshore IT outsourcing has lead to an increase in operational failures. We explore IT offshoring relationships from the clients' perspective, through case study and survey methods, and suggested measures that can increase the success rate in IT offshoring engagements.

093-0076 A Study of Healthcare Information System and Healthcare Productivity Efficiency in Public Hospitals of India

Sri Vidhya Bhavani Munuswamy, Student, Indian Institute of Technology Madras, India
Prakash Sai Lokachari, Professor, Indian Institute of Technology Madras, India

Advances in Healthcare Information Systems offer a great potential in improving quality, safety, and efficiency of hospital services. The role of IT capability in improving efficiency of healthcare processes has been garnering greater attention from researchers and practitioners.In this paper we study the efficiency of Healthcare Information Systems and Healthcare Productivity.

093-0777 How Should IT Support Complex Emergent Knowledge Work? Observations from Action Research

Francis Gleeson, Post Doc/Researcher, University College Dublin, Ireland
Vincent Hargaden, Associate Professor, University College Dublin, Ireland
Paul Coughlan, Professor, Trinity College Dublin, Ireland
Lizbeth Goodman, Professor, University College Dublin, Ireland

Knowledge work in complex manufacturing often requires ad-hoc data analysis. How can IT support a myriad of decision support scenarios without excessive cost? Based on action research, this paper examines the relationship between effective actions and efficiency, and proposes information decoupling points and contextual training as possible solutions.

Sunday, 08:00 AM - 09:30 AM

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

Invited Session: Public and Humanitarian Operations Management Applications

Chair(s): Douglas Alem

093-2382 Drought Risk Assessment: A Systematic Literature Review

Raissa Bravo, Student, PUC Rio, Brazil
Fernando Luiz Cyrino Oliveira, Professor, Pontifícia Universidade Católica do Rio de Janeiro - PUC-Rio, Brazil
Adriana Leiras, Professor, Pontifícia Universidade Católica do Rio de Janeiro - PUC-Rio, Brazil

This paper analyzes the evolution of the research on drought risk assessment over the years through a systematic literature review. We classify the papers according to the typology of drought, the risk measures and indicators such as year, author, journal, and keywords. The results indicate the gaps and publication trends.

093-2384 Prioritization-Driven Logistics Planning in Disaster Relief

Rafaela Veloso, Student, Universidade Federal de São Paulo, Brazil
Douglas Alem, Lecturer, University of Edinburgh, United Kingdom
Tolga Bektas, , ,
Juliana Cespedes, Professor, Federal University of São Paulo, Brazil

We consider a particular location-allocation problem arising in humanitarian logistics that entails establishing response facilities and prepositioning relief aid. In contrast to common monetary-driven objectives often used in the literature, we offer a different perspective primarily based on prioritization, which is reflected in the objective and structure of the problem.

093-2381 Formulations and Valid Inequalities for the Heterogeneous Multi-Crew Scheduling and Routing Problem

Alfredo Moreno, Student, Federal University of Sao Carlos, Brazil
Pedro Munari, Professor, Federal University of Sao Carlos, Brazil
Douglas Alem, Lecturer, University of Edinburgh, United Kingdom
Michel Gendreau, Professor, CirrelT and École Polytechnique, Canada

We develop three new optimization models and valid inequalities for the heterogeneous Multi-Crew Scheduling and Routing Problem (MCSRP) in road restoration. The MCSRP relies on finding the schedule and the route of heterogeneous crews that will perform the recovery of damaged nodes in a network affected by extreme events.

093-1345 Integration and Emergency Response Performance in the Public Sector: The Moderating Effect of Task Complexity

Rebecca Duray, Professor, University of Colorado Colorado Springs, United States
Ying Fan, Associate Professor, University of Colorado Colorado Springs, United States
Monique French, Associate Professor, University of Colorado Colorado Springs, United States

This paper applies supply chain integration frameworks to emergency response services in the public sector. Using a national database, the study investigates the impact of mutual aid through giving and receiving resources between fire agencies on emergency response performance. It further examines the moderating effect of task complexity.

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Sunday, 08:00 AM - 09:30 AM, Jay — Track: Emerging Topics in Operations Management

Contributed Session: Innovations and Management

Chair(s): Dongli Zhang

093-0571 Ambidexterity and Complexity in 'VUCA' High-Tech Projects

Roula Michaelides, Reader, Manchester Metropolitan University, United Kingdom
Martin Rost, Associate Professor, University of Stuttgart, Germany
Zenon Michaelides, Reader, Manchester Metropolitan University, United Kingdom

This research studies the impact of critical-incidents from an operations-perspective, particularly in developing ambidexterity. In business-environments characterized by volatility, uncertainty, complexity, and ambiguity, technology companies struggle to simultaneously explore and exploit innovations. A phenomenological case-study approach was adopted, comprising of high-tech managers and highlighting how they cope with complexity to solve critical incidents.

093-1685 Mapping Innovation Culture Elements in a Brazilian Steel Company

Danilo Mariano, Student, Centro Paula Souza, Brazil
Eliane Simoes, Professor, CPS, Brazil

Innovation is a growing need within organizations. That said, it is important to identify which elements influence a favorable organizational culture once it's a base for a company's capacity to generate innovation. This article aims to compare a Brazilian steel company with the 150 most innovative companies according to the Boston Consulting Group.

093-1744 Business Models in Social Entrepreneurship: A Systematic Review

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

Business models in social entrepreneurship got attention from academia, practitioners, and policymakers, but are little explored as a field of study. We have systematically reviewed articles from top rated ABDC journals. The findings suggest that value delivery is a missing link between value creation and value capture.

093-0714 Should the Cloud-Based Ecosystem Embrace the Open Source Communities? A Game Theoretical Analysis

Ning Wei, Student, Tianjin University, China
Wenhua Li, Associate Professor, Tianjin University, China
Junpeng Guo, Professor, Tianjin University, China

Cloud service providers are trying to build an ecosystem to integrate with upstream and downstream partners by including the open source communities (e.g. Microsoft and GitHub, IBM and RedHat). In this paper, we develop a three stage game-theoretical model to analyze the effect of this integration campaign.

093-0247 Stakeholder Enactment as Performance Buffer for Contingency Misfits

Michael Pirson, Associate Professor, Fordham University Gabelli School of Bus, United States
Dongli Zhang, Associate Professor, Fordham University Gabelli School of Bus, United States

This study explores how contingency misfit can possibly be compensated. The paper focuses on stakeholder enactment as a dynamic adaptation mechanism to overcome misfit. Our study shows that enactment of internal stakeholders buffers the structure-strategy misfit, while enactment of external stakeholders buffers both the environment-organization misfit and structure-strategy misfit.

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Sunday, 08:00 AM - 09:30 AM, Holmead East Track: Global Supply Chain Management

Invited Session: Sourcing and Operations in Global Supply Chains

Chair(s): Gerd Hahn Arun Chockalingam

093-1450 Dual Sourcing Over the Product Life Cycle

Jiankun Sun, Student, Northwestern University, United States
Jason Acimovic, Assistant Professor, Penn State University State College, United States
Doug Thomas, Professor, University of Virginia, United States
Jan Van Mieghem, Professor, Northwestern University, United States

We study various dual sourcing heuristics for non-stationary demands over a product life cycle. We find that the days-sales-of-inventory (DSI) policy naturally caps the slow orders as the capped dual index (CDI) policy. Our numerical study shows that both DSI and CDI policies outperform other policies due to the cap.

093-1641 Dual Sourcing in the Age of Near-Shoring: Trading-Off Stochastic Capacity Limitations and Long Lead Times

Marko Jakšič, Associate Professor, Faculty of Economics, Slovenia
Jan Fransoo, Professor, Kuehne Logistics University, Germany

We study a dual sourcing inventory with a stochastic capacitated faster supply mode. We show the implications of the model for two cases: the near-shoring trend that may be hampered by the lack of near-shore supply capacity and for the transport model split under the Belt and Road Initiative.

093-1554 Managing Flexibility in Pharmaceutical Supply Chain Networks: A Stochastic Programming Approach

Gregor Blossey, Student, GGS Heilbronn, Germany
Gerd Hahn, Professor, GGS Heilbronn, Germany
Achim Koberstein, Professor, European University Viadrina Frankfurt (Oder), Germany

This research examines the value of process and volume flexibility in the pharmaceutical supply chain as a means to prevent drug shortages. A two-stage stochastic programming model is developed considering uncertainty in demands and production approvals. Furthermore, a numerical study based on a real-life case example is presented.

093-0704 Transfer Pricing in Newsvendor Networks: The Tax-Minimization Option of Dual Sourcing

David Francas, Professor, Hochschule Heilbronn, Germany
Gerd Hahn, Professor, GGS Heilbronn, Germany
Shailesh Kulkarni, Professor, University of North Texas, United States

Extending the newsvendor networks approach to multi-national companies, we study the impact of tax-effective transfer pricing on capacity investment decisions in global manufacturing networks under random demand. We analytically derive a threshold that defines whether single or dual source investment is optimal and demonstrate the robustness of our results.

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Sunday, 08:00 AM - 09:30 AM, Holmead West Track: Retail Operations

Invited Session: Operations in an Omnichannel World (Book)

Chair(s): Santiago Gallino Antonio Moreno

093-0529 New Functions of Physical Stores in the Age of Omnichannel Retailing

Fei Gao, Assistant Professor, Indiana University Bloomington, United States
Xuanming Su, Professor, University of Pennsylvania, United States

In the omnichannel era, physical stores are far more than a mere selling channel. In this book chapter, we present a model framework to study two new functions of physical stores (i.e., showrooms and in-store pick-up) in an omnichannel environment.

093-0540 Omnichannel Assortment Planning

Robert Rooderkerk, Associate Professor, Rotterdam School of Management, Netherlands
Gurhan Kok, Professor, Koc University, Turkey

We describe the notion of omnichannel assortment planning, contrasting it to planning per channel. We discuss the strategic, tactical, and operational challenges. Addressing these requires an intimate connection between the marketing and operations functions of firms, the use of state-of-the-art technologies and data integration along the customer journey.

093-0789 Omni-Channel Operations: Challenges, Opportunities, and Models

Stefanus Jasin, Associate Professor, University of Michigan, United States
Amitabh Sinha, Principal Scientist, Amazon.com, United States
Joline Uichanco, Assistant Professor, University of Michigan, United States

We discuss the operational challenges and opportunities in fulfillment, pricing, and inventory management with omni-channel retail. We provide a historical perspective of the evolution of omni-channel operations, challenges associated with each stage, and an overview of mathematical models of fulfillment, pricing, and inventory management in omni-channel retail.

093-0816 Omnichannel Assortment Decisions in a Fashion Retailing Supply Chain

Annibal Sodero, Assistant Professor, University of Arkansas - Fayetteville, United States
Elliot Rabinovich, Professor, Arizona State University Tempe, United States

We empirically assess an attribute-based assortment integration model to assist omnichannel fashion product vendors to decide which products and how many units of them to allocate across channels, well before the selling season, when they will be able to observe actual demand.

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Sunday, 08:00 AM - 09:30 AM, Gunston East Track: Humanitarian Operations and Crisis Management

Invited Session: Analytical Models in Humanitarian Operations

Chair(s): Arian Aflaki

093-0724 Humanitarian Organization Pre-Disaster Deployment for Predictable Disasters

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

Initial deployment decisions are critical to Humanitarian Organizations. Deploying too little or too much inventory can result in bad publicity and unhappy donors. We use a stochastic optimization model to investigate the initial deployment decision, the surrounding costs, and optics of varying disaster scenarios.

093-1318 Volunteers and Paid Workers in a Nonprofit Operation

Gemma Berenguer, Assistant Professor, Purdue University, United States
Lei Li, Student, Purdue University, United States

A nonprofit organization offers activities run by workforce that can be composed of a mix of volunteers, part-time and full-time workers. We study this setting and its trade-offs by designing a finite-horizon staff hiring and assignment problem and by suggesting optimal and near-optimal hiring and assignment policies.

093-1351 The Facts on the Ground: Using Simulation to Understand Policies in Humanitarian Fleet Management

Liyi Gu, Student, University of Maryland, United States
Ilya Ryzhov, Associate Professor, University of Maryland, United States
Mahyar Eftekhar, Assistant Professor, Arizona State University Tempe, United States

Humanitarian field managers often lack systematic guidance in decision making. We develop empirical and stochastic models of humanitarian fleet management and build a simulator, evaluating policies that may be used by field managers. The results provide insight to the reasoning behind managers' decisions and could lead to improved policy recommendations.

093-1455 Allocation of Nonprofit Funds on Program, Fundraising, and Administration

Telesilla Kotsi, Student, Kelley School of Business, United States
Goker Aydin, Professor, Johns Hopkins University, United States
Alfonso Pedraza-Martinez, Associate Professor, Indiana University, United States

Program, fundraising, and administration are the three expenses among which a nonprofit allocates its budget. Our analytical model prescribes the right balance between the immediate reward of program and the future reward of fundraising and administration. Our case study analyzes the allocation decisions of two nonprofits with different operating models.

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

Invited Session: Product Returns and Blockchains

Chair(s): Gokce Esenduran

093-0056 "Need for Speed", But How Much Does It Cost? Fee-Speed Relationship on Bitcoin Transactions

Noyan Ilk, Assistant Professor, Florida State University, United States
Shaokun Fan, Assistant Professor, Oregon State University, United States
Guangzhi Shang, Assistant Professor, Florida State University, United States
Leon Zhao, Professor, City University of Hong Kong, Hong Kong

The long-term adoption of cryptocurrencies such as Bitcoin is threatened by the “transaction fee crisis” (i.e., extreme volatility in fees and processing times under increasing system load). We introduce an empirical framework to study the fee-speed relationship.

093-0172 Product Customization and Returns

Paolo Letizia, Assistant Professor, University of Tennessee Knoxville, United States
Gokce Esenduran, Assistant Professor, Purdue University, United States
Anton Ovchinnikov, Associate Professor, Queens University, Canada

We study the firms' optimal decision about product customization and returns. We show that these decisions depend on the two measures of value-contribution and value-efficiency and the salvage values for returns.

093-0576 How Does a Return Period Policy Change Affect Multichannel Retailer Profitability?

Necati Ertekin, Assistant Professor, Santa Clara University, United States
Anupam Agrawal, Associate Professor, Texas A&M University College Station, United States

Many retailers have recently sought to tighten their return policy by decreasing the return period window. We theoretically and empirically investigate the impact of such a policy change on sales, returns, and profitability for a multichannel retailer.

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

Invited Session: Operational Workforce Management through Emerging Technologies and Data Analytics

Chair(s): Constantine Moros

093-1271 Analytics Culture and Talent Capability Impacts on Firm Performance: An Empirical Study in the USA

Samuel Fosso WAMBA, Professor, TOULOUSE BUSINESS SCHOOL, France
Shariar Akter , Associate Professor, Wollongong University, Australia

Although big data analytics is gaining momentum in operations research, developing an analytics culture and talent capability remains a big challenge. Based on two Delphi studies and 202 surveys with data scientists in the U.S., this study shows the importance of analytics culture in enhancing talent capability and firm performance.

093-0619 Less is More: Improving Store Performance by Reducing Volume Flexibility at the Gap, Inc.

Saravanan Kesavan, Associate Professor, University of North Carolina Chapel Hill, United States
Susan Lambert, Associate Professor, University of Chicago, United States
Joan Williams, Professor, University of California, College of Hastings, United States

In this study, we run a 9 month field experiment in 28 stores of the Gap Inc. to improve the work schedule of retail associates. We show that curbing volume flexibility can lead to higher productivity in the workforce resulting in a win-win for both employees and employer.

093-0721 Improving Personnel Management in an Era of IT Transformation

Constantine Moros, Director & CESA Advisory Markets Coordinator, EY (Ernst & Young) - Advisory Services, Greece

Managing personnel is becoming more challenging and complicated as technological advancements are accelerating. We provide a conceptual framework and methodology for measuring, assessing, and planning personnel capacity utilization in a more accurate and dynamic way where data analytics and IT transformation opportunities are exploited for optimizing personnel productivity and efficiency.

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Sunday, 08:00 AM - 09:30 AM, Fairchild West Track: Socially Responsible Operations

Invited Session: Sustainable Supply Chains

Chair(s): Verónica Villena

093-0297 Collective ESG Disclosure in Supply Chains

Jury Gualandris, Assistant Professor, Ivey Business School, Western University, Canada
Annachiara Longoni, Assistant Professor, Esade Business School, Spain
Davide Luzzini, Associate Professor, Eada Business School , Spain

Exploiting a dataset of 189 four-tier supply chains, we examine whether collective supply chain disclosure – the average effort by multiple suppliers operating in the same supply chain to disclose ESG data and information to the public – depends upon heterogeneity and interconnectedness of the supply chain structure.

093-0727 Disentangling Drivers for Social and Environmental Responsibility: An Investigation in Philips' Chinese Supply Chains

Veronica Villena, Assistant Professor, Penn State University University Park, United States
Miriam Wilhelm, Associate Professor, University of Groningen, Netherlands
Cheng Yong Xiao, Student, University of Groningen, Netherlands

We offer a systematic comparison of which drivers are more effective to address either environmental or labor non-conformities. The results show that pressure for regulators, lean training, and trust are effective drivers for supplier environmental responsibility whereas suppliers' perceptions of threats is the only effective driver for supplier social responsibility.

093-1066 Market Forces and Corporate Responsible Sourcing – Lessons from Rana Plaza

Brian Jacobs, Associate Professor, Pepperdine University, United States
Vinod Singhal, Professor, Georgia Institute of Technology, United States

It has been shown that the stock market reaction to Western retailers sourcing from Bangladesh at the time of the 2013 Rana Plaza tragedy was insignificant. Six years after the tragedy, we update this research with expanded and more recent data.

093-0478 The Impact of Leader Worker Disability Status Similarity on Operational Outcomes

Dustin Cole, Student, Michigan State University, United States
Sriram Narayanan, Associate Professor, Michigan State University, United States

We examine the impact of leader disability status on performance outcomes of workers with disabilities in a garment manufacturing setting. We find that span of control plays a role in this relationship, such that leaders with disabilities do benefit disabled workers at lower spans of control.

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

Invited Session: Sustainable Transportation and Trade Perspectives

Chair(s): Michael Lim

093-0882 Exploiting Virtual Vehicles in Green Vehicle Routing

Isil Koyuncu, Student, University of Alabama Tuscaloosa, United States
Mesut Yavuz, Associate Professor, University of Alabama Tuscaloosa, United States

This talk addresses a family of green vehicle routing problems that incorporates several key modeling aspects such as refueling at customer and non-customer locations, and various refueling policies. Moreover, in the solution approach, the virtual gasoline diesel vehicles are exploited in the homogeneous green vehicle routing context.

093-1132 Money Well Spent? Operations, Mainstreaming, and Fairness of Fair Trade

Michael Lim, Associate Professor, Seoul National University, South Korea
Ho-Yin Mak, Associate Professor, Oxford University, United Kingdom
Seung Jae Park, Assistant Professor, Yonsei University, South Korea

We analyze operations of various stakeholders in the value chain of fair trade certified products, as well as the role and social welfare of fair trade organizations with different philosophies. We examine the impact of mainstreaming and identify the welfare allocation among various stakeholders.

093-1272 On the Values of Vehicle-to-Grid Electricity Selling in Electric Vehicle Sharing

Yiling Zhang, Student, University of Michigan, United States
Mengshi Lu, Assistant Professor, Purdue University, United States
Siqan Shen, Assistant Professor, University of Michigan, United States

We study the benefit of integrating vehicle-to-grid (V2G) technology in electric vehicle sharing systems. We formulate a stochastic programming model to optimize the infrastructure planning, fleet management, and charging/V2G operations. We use numerical experiments to quantify the effect of V2G in the profitability, quality-of-service, and social-environmental benefit of carshare systems.

093-2169 Revenue Management in Parking Systems Under Competition and Information Asymmetries

Yuguang Wu, Student, University of Wisconsin Madison, United States
Qiao-Chu He, Assistant Professor, University of North Carolina Charlotte, United States
Xin Wang, Assistant Professor, University of Wisconsin Madison, United States

We consider oligopoly pricing game in parking systems under incomplete information. Each agent (garage) has some information (forecast) about the incoming parking demand for some of the garages. From the equilibrium strategy, we investigate the agents' incentive to share their information with others.

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

Invited Session: Analytics of Revenue Managemet in Service Operations

Chair(s): Cheng Zhu

093-0156 Selection-Proof Reimbursement of Healthcare Costs in Capitilization Payment Models

Zhaowei She, Student, Georgia Tech, United States
Turgay Ayer, Associate Professor, Georgia Tech, United States
Daniel Montanera, Assistant Professor, Georgia State University, United States

Capitation payment models have been increasingly adopted by payers in U.S. healthcare markets during the past decade. This paper studies the optimal reimbursement to induce targeted quality provision in capitation programs when the payer can observe types (i.e., sickness) of patients, but cannot explicitly contract actions (i.e., treatment choices) of providers.

093-1166 Online Matching and Learning Under Concave Rate of Returns

Chaithanya Bandi, Assistant Professor, Northwestern University, United States
Yam Huo Ow, Student, Northwestern University Kellogg School o, United States

We examine online bipartite matching under concave rate of returns with learning of uncertain qualities. Our analysis is motivated by challenges faced in the online gig economy. We present an optimal online algorithm and characterize its performance, and conduct an empirical study with a well-known online freelancer platform.

093-0420 Dynamic Pricing Under the Data Driven in the Sharing Economy

Qing Zheng, Student, Huazhong University of Science & Technology, China
Wenjie Zhan, Professor, Huazhong University of Science & Technology, China

With the advent of information age, a new business model - The Sharing Economy was born and has been developing quickly. To make the market more efficient, it is of vital importance to study the pricing strategies in the sharing bikes, thus creating a balance between the supply and demand.

093-0911 Allocation of Charging Facilities for Electronic Vehicles Under Demand Uncertainty

Cheng Zhu, Post Doc/Researcher, Nanjing University, Canada
Ting Wu, Assistant Professor, Nanjing University, China

To facilitate the decision making of charging facilities for the electronic vehicles, we design an analytical framework combining demand depiction from real-life data and optimization approaches. This study aims to address the multi-stage problems - where, how many, and what types of charging devices should be installed.

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

Invited Session: Data Driven Research in Business

Chair(s): Xuying Zhao

093-0856 The Strength of the Weak Tie: Forecast Sharing with Multiple Suppliers

Meng Li, Assistant Professor, Rutgers University, United States
Yue Li, Student, Tsinghua University, China
Yang Zhang, Assistant Professor, National University of Singapore, Singapore

The retailer in a complementary goods supply chain considers whether to share its private demand forecast with suppliers strategically. Lab experiment data finds that the retailer is increasingly better off being honest when the number of suppliers increases and coordination failure helps suppliers approach the first best with low market demand.

093-0726 Retail Return Time Window: Theory and Empirical Evidence

Guangzhi Shang, Assistant Professor, Florida State University, United States
Li Wang, Student, Florida State University, United States

We develop a consumer utility model concerning the retailer's return time window, further tested by two empirical studies. We find the time consumers take before the return related to the level of product uncertainty and evaluate the impact of product reviews on the value of return time window to consumers.

093-1972 Data Driven Analysis of Competitive Free Shipping Policies by Online Retailers

Gihan Edirisinghe, Student, Washington State University Pullman, United States
Charles Munson, Professor, Washington State University Pullman, United States
Narmada Balasooriya, Student, University of Peradeniya, Sri Lanka

Amazon Prime has revolutionized home delivery cost perceptions. We develop a model using non-linear MIP to analyze several common shipping programs used by online retailers to determine the best policies under different circumstances and make recommendations. We build a Python-based web crawler to obtain data from Amazon for this analysis.

093-2255 Can Leanness Predict Financial Distress?

Feng Mai, Assistant Professor, Stevens Institute of Technology, United States
Xuying Zhao, Associate Professor, University of Notre Dame, United States

We utilize financial and operational data from 6,683 manufacturing firms in the US to build a prediction model for financial distress. We show that incorporating leanness variables can help to improve financial distress prediction accuracy.

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Sunday, 08:00 AM - 09:30 AM, Coats Track: Manufacturing Operations

Invited Session: Seru systems in China

Chair(s): Jiafu Tang

093-2438 A Case Study on Seru Production Application in an Electronic-Information Company in China

Xiaojing wang, Associate Professor, Dongbei University of Finance & Ecnomics, China

Due to its successful implementation in many Japanese electronics companies, seru production has drawn more and more research attention in recent years. This study takes China Hualu Panasonic as the case to explore the reasons why it adopted seru and the application effectiveness.

093-2436 Towards the Order Dispatch and Routing Simulation Platform for Realistic O2O Food Delivery Application

Ming Gao, Associate Professor, Dongbei University of Finance & Ecnomics, China
Wenzhe Jin, Student, Dongbei University of Finance & Economics, China, China
Weihua Wu, Student, Dongbei University of Finance & Economics, China, China

We'd like to share the development progress of the O2O food delivery simulation platform, including orders dispatch (push and pull) dynamics, multi-agents' queueing behavior, delivering routing simulation, and different order dispatch rules or heuristics, to compare multi-agents' performance under different demand distributions and optimization of order dispatch.

093-1238 Improvement of Manufacturing Performance From Introducing SERU: An Empirical Study in China

chang liu, Professor, Dongbei University of Finance and Economics, China

In this paper, we take a survey by defining a set of KPIs based on SCOR. We also define the measure of SERU practice. A statistical analysis is conducted to examine the impacts of SERU on the KPIs. Then, a deep case study is done based on several representative firms.

093-2437 The Optimal Operation of Hybrid-Seru System: Based on an Exact Algorithm

Yuting Wu , Student, Northeastern University, China
Yang Yu, Lecturer, Northeastern University, United States
Jiafu Tang, Professor, Dongbei University of Finance and Economics, China

Considering the merits such as enhancing productivity, saving cost, reducing setup time, seru production was applied widely in the electronic industry as an innovation of the assembly system. The hybrid-seru system with serus and a short line is more practical than pure seru system due to suit for more situations.

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

Invited Session: Scheduling and Resources Management

Chair(s): Honggang Wang

093-2109 A Simulation-Based Framework for Resource Allocation Optimization

Xiuxian Wang, Student, Shanghai Jiao Tong University, China
Xuran Gong, Student, Shanghai Jiao Tong University, China
Na Geng, Associate Professor, Shanghai Jiao Tong University, China

To deal with the capacity allocation and case mix, this paper proposes a non-linear stochastic programming model to minimize the weight cost of rejecting customers and having them wait. To solve this model, we propose a meta-model-based simulation optimization framework. Numerical results show the efficiency of the proposed algorithm.

093-1201 Value Stability in Multi-Mode Projects with Stochastic Activity Durations

Claudio Szwarcfiter, Student, Technion Israel Institute of Technology, Israel
Avraham Shtub, Professor, Technion Israel Institute of Technology, Israel
Yale Herer, Associate Professor, Technion Israel Institute of Technology, Israel

We developed a reinforcement learning-based algorithm to maximize project value subject to due date and budget constraints in multi-mode projects. The activity durations are stochastic and we find solutions that satisfy given on-time and on-budget probabilities. In our experiments, our algorithm outperformed a previously published genetic algorithm.

093-2263 Multi-Criteria Planning for Optimal Development of Power Network of Microgrids

Honggang Wang, Professor, ????, United States
Tongdan Jin, Associate Professor, ????, United States

We propose stochastic optimization models for optimal development of a network of power microgrids. The distributed energy resources within microgrids are connected to share power across neighboring communities and operate against unexpected disruptions. We demonstrate the effectiveness and efficiency of our models and methods using a 12-node network case.

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

Invited Session: Healthcare process management

Chair(s): David Peng

093-2075 Operating Rooms' Turnover Process Redesign Through Improved Staff Capacity Planning Guided by Queuing Models

Vikram Tiwari, Associate Professor, Vanderbilt University Medical Center, United States

Stationary independent period-by-period G/G/s queuing model helped determine staffing levels for operating rooms cleaning crews to ensure that no OR waits longer than 10 minutes. The model helped restructure support staff roles and create a hierarchy between lower and higher valued roles, leading to increased efficiencies and staff satisfaction.

093-0407 Differentiating Inter-Hospital Transfer Types: Varied Impacts on LOS and Diverging Destination Selection Strategies

Raymond Lei Fan, Student, University of Houston, United States
Ming Zhao, Assistant Professor, University of Houston, United States
David Peng, Associate Professor, University of Houston, United States

Using patient level data, we develop a methodology to classify inter-hospital patient transfers and investigate the effects of different transfer types on length of stay. For each type, we identify the better transfer destination considering system relationships. The findings could help hospitals manage transfers more efficiently and save costs.

093-0122 Impact of the Value-Based Purchasing Program on Hospital Operations Outcomes: An Econometric Analysis

Seung Jun Lee, Assistant Professor, Chung-Ang University, South Korea
Sriram Venkataraman, Assistant Professor, University of South Carolina, United States
Gregory Heim, Associate Professor, Texas A&M University College Station, United States
Aleda Roth, Professor, Clemson University, United States
Jon Chilingerian, Professor, Brandeis University, United States

The project examines VBP financial penalties to determine whether and how they change the operating outcomes of care providers. Using secondary data sets, we empirically estimate the magnitude of financial penalty and care process improvements.

093-1834 Do Acquisitions Improve Hospital Operating Performance? The Roles of Geographic Proximity and Service Line Similarity

Yuqiao Cheng, Student, University of Houston, United States
David Peng, Associate Professor, University of Houston, United States
Yuan Ye, Assistant Professor, California State University Sacramento, United States

The study estimates the extent to which the performance improvements of the acquired hospitals are derived from similarities between the acquired and the acquirer hospitals in two operational characteristics. The findings suggest that hospitals looking to acquisitions should jointly evaluate geographical proximity and service lines similar to the acquisition target.

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Sunday, 08:00 AM - 09:30 AM, Columbia 3 Track: Healthcare Operations Management

Invited Session: Data-driven analytics for healthcare operations and policy

Chair(s): Wc Benton

093-0319 Early Information Access to Alleviate Emergency Department Congestion

Anjee Gorkhali, Student, Old Dominion University, United States
Ling Li, Professor, Old Dominion University, United States

This study explores the impact of information access and availability on the information processing need and the ability of a hospital. Technical devices, such as RFID, are identified as a driver to alleviate emergency department congestion.

093-0497 Adaptive Capacity Planning for Ambulatory Surgery Centers (ASCs)

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

Chelliah Sriskandarajah, Professor, Texas A&M University College Station, United States
Vikram Tiwari, Associate Professor, Vanderbilt University Medical Center, United States

ASC capacity planning is challenging due to multi-stage nature of services and significant uncertainty in patient-mix and service durations. We propose a bed capacity planning/adjustment framework based on optimization tools combined with analytics. We discuss implications for practitioners, such as the impacts of adding/removing certain surgical procedures on capacity.

093-0572 The Unintended Consequences of Health Policy: An Empirical Analysis of Opioid Prescribing Behavior

Justin Kistler, Student, University of South Carolina, United States
Luv Sharma, Assistant Professor, University of South Carolina, United States

The Value Based Purchasing (VBP) program was designed to improve the safety and quality of patient care. While considerable improvement has been made in many domains, our empirical analysis of opioid prescription rates indicates an unintended increase in opioid prescribing immediately following the implementation of the VBP program.

093-1433 An Empirical Analysis of the Impact of Primary Care Access on Emergency Department Utilization

Eric Xu, Student, University of Minnesota, United States
Kevin Linderman, Professor, University of Minnesota, United States
Anant Mishra, Associate Professor, University of Minnesota, United States

The Patient Protection and Affordable Care Act has yielded mixed results in Emergency Department Utilization. It is posited that the financial access provided by Medicaid Expansion is moderated by structural access, whether that be distance to resources or the hours of operation of Primary Care.

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

Invited Session: Healthcare Operations

Chair(s): Hessam Bavafa

093-0503 Personalized Health Care Outcome Analysis of Cardiovascular Surgical Procedures: An IV Tree Approach

Guihua Wang, Student, University of Michigan - Ann Arbor, United States
Jun Li, Assistant Professor, University of Michigan - Ann Arbor, United States
Wallace Hopp, Professor, University of Michigan - Ann Arbor, United States

Using patient-level data from thirty-five hospitals for six cardiovascular surgeries in New York State, we identify patient groups that exhibit significant differences in outcomes with a new Instrumental Variable (IV) Tree approach and quantify the differences in a patient-centric manner that is useful to patients, payers, and providers.

093-1425 Adoption and Integration of Medical Research into Clinical Practice

Jonathan Helm, Assistant Professor, Kelley School of Business, United States
Pengyi Shi, Assistant Professor, Purdue University, United States
H. Sebastian Heese, Professor, North Carolina State University, United States
Alice Mitchell, Assistant Professor, Indiana University, United States

In medical research, new diagnostic tests are developed and evaluated solely on their efficacy in detecting an illness. However, ignoring the workload impact of introducing new tests into existing workflow can create barriers to adoption. We develop a framework for medical research adoption into clinical environments that considers both metrics.

093-2131 Shared Medical Appointments: An Innovative Approach to Healthcare Delivery

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

We examine the performance implications of shared medical appointments, in which multiple patients with a common condition interact with a healthcare provider in the same appointment. Through a randomized control trial, we study the effects of shared medical appointments on patient satisfaction, knowledge, compliance, follow-up rates, and health outcomes.

093-1520 Work After Work: The Impact of New Service Delivery Models on Work Hours

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

Many professional services require delivery across multiple channels: in-person meetings, phone calls, and emails. In these settings, “work after work” can become prevalent and a marker for burnout. We empirically examine the extent of “work after work” among physicians providing care to patients via in-person office visits and online e-visits.

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

Invited Session: Service Quality in Healthcare Operations

Chair(s): Leon Cui

093-0633 Engineering the Delay Announcement to Improve Patient Satisfaction

Sina Ansari, Post Doc/Researcher, Tuck School of Business, United States
Laurens Debo, Associate Professor, Dartmouth College, United States
Seyed Iravani, Professor, Northwestern University, United States

Excessive wait-time is the most common reason patients become dissatisfied and leave the Emergency Department (ED) before being treated, which have negative financial and medical consequences. In a field experiment in an urban ED, we study the impact of announcing wait-times on patient satisfaction.

093-0663 Evaluating Capacity Planning Methods for Loss Systems: Application to Emergency Medical Services

Mohammad Delasay, Assistant Professor, Stony Brook University, United States
Armann Ingolfsson, Professor, University of Alberta, Canada
Amir Rastpour, Assistant Professor, University of Ontario Institute of Technology, Canada

We evaluate the accuracy of the stationary independent period-by-period (SIPP) method for capacity planning of loss systems with continuous random cyclic demands. Focusing on the specifications of emergency medical services, we show SIPP might miss the quality of service targets drastically.

093-1170 Competition for Blood Donations

Anna Nagurney, Professor, University of Massachusetts Amherst, United States
Pritha Dutta, Student, University of Massachusetts Amherst, United States

We develop a game theory model for blood donations in which blood service organizations seek to maximize their transaction utilities and compete on the quality of service that they provide at the blood collection sites. The results obtained at equilibrium demonstrate that enhanced competition can improve the service quality level.

093-1043 The Value of mHealth For Managing Chronic Conditions

Saligrama Agnihothri, Professor, Binghamton University, United States
Leon Cui, Assistant Professor, Binghamton University, United States
Mohammad Delasay, Assistant Professor, Stony Brook University, United States
Balaraman Rajan, Assistant Professor, California State University East Bay, United States

Chronic conditions place a high cost burden on the healthcare system and deplete the quality of life for millions of Americans. Mobile technologies can be used to provide efficient and effective healthcare. We attempt to evaluate the impact of using these technologies on health outcomes for patients with a chronic disease.

364

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

Contributed Session: Empirical research in health IT

Chair(s): Kaitlin Wowak

093-2352 Financial Impacts of Electronic Medical Record Systems on Hospital Operations

C. Christopher Lee, Associate Professor, Central Connecticut State University, United States
Yong-Taek Min, Assistant Professor, Florida Gulf Coast University, United States

This research investigates if EMR systems implementation makes a significant effect on hospital financials. ANOVA model tests financial variables such as operating margin, revenue, etc., from the 2015 AHA survey data, in terms of three groups: (1) hospitals with no EMR (2) partial EMR and (3) full EMR systems implementation.

093-0876 Research of the Online-and-Offline Interactive Value Creation Model of Health Data

Xi Gong, Student, Southeast University, Nanjing, China, China
Lindu Zhao, Professor, Southeast University, Nanjing, China, China

This work introduces the model of an online-and-offline interactive health data platform. The model adds the factor of patients that attend offline connectivity based on online HIE network only including factors of HIE Providers and Healthcare Practitioners to analyze the effectiveness and advantage of an HIE platform in offline use.

093-0551 Assitance or Overturn: How Artificial Intelligence Can Play a Role in the Healthcare System

Da Huo, Student, City University of Hong Kong, China
Kwai Sang Chin, Associate Professor, City University of Hong Kong, China
Zhili Zhou, Professor, Xi'An Jiaotong University, China

AI in health care is a hot topic among both academic and industrial communities. However, a framework for integrating and assessing AI to fit into the current system or to reshape if necessary is still required. This paper examines the performance of different modes and how the results vary among scenarios.

093-2182 Advancing Equity in the Mental Healthcare Supply Chain: Empirical Evaluation of a Mobile App

Yi Tang, Student, University of Minnesota, United States
Kingshuk Sinha, Professor, University of Minnesota, United States
Adam Moen, Founder and Principal, Real Empowerment Collaborative, United States

We empirically investigate user adoption and usage behavior of a mental health mobile app and its impact on users' mental health conditions. The results indicate that mobile app can create capacity in a mental healthcare supply chain so as to reduce the disparities associated with gender, sexual orientation, and ethnicity.

093-0755 Strategic Sourcing of Multi-Component Software Systems: The Case of Electronic Medical Records

Kaitlin Wowak, Assistant Professor, University of Notre Dame, United States
Sean Handley, Associate Professor, University of South Carolina, United States
Ken Kelley, Professor, University of Notre Dame, United States
Corey Angst, Associate Professor, University of Notre Dame, United States

Using data on U.S. hospitals from 2005 to 2013, and employing a multi-level longitudinal modeling framework, we examine how two dimensions of the sourcing strategy for electronic medical record systems – closeness to single-sourcing and degree of switching – impact experiential quality, a measure of hospital performance.

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

Invited Session: Inventory Models in Retail Supply Chains

Chair(s): Shi Chen

093-0741 Managing Inventory for a Multi-Divisional Corporation with Cash Pooling

Kevin Shang, Professor, Duke University Durham, United States
Jianan Wang, Student, Zhejiang University, China
Yi Yang, Associate Professor, Zhejiang University, China

We examine the benefit of cash pooling on inventory replenishment for a corporation with multiple divisions. We provide a simple and e?ective heuristic based on an innovative lower bound to the optimal value function. Our results can be applied to a cash-constrained retailer with multiple products.

093-1339 Managing Retail Inventory Using Arbitrary Prepacks

Naren Agrawal, Professor, Santa Clara University, United States
Stephen Smith, Professor, Santa Clara University, United States

We generalize (R, nQ) policies and develop a methodology that determines optimal replenishment policies for arbitrary combinations of different prepacks. The problem is formulated as a stochastic DP and solved by an LP in the steady state case. Numerical analysis reveals interesting managerial insights about prepack design.

093-1451 Data-Driven Middle-Mile Delivery Network Optimization for Online Retailers

Shuyu Chen, Student, Duke University Durham, United States
Jeannette Song, Professor, Duke University Durham, United States

The middle-mile delivery for an online retailer is the shipment of packages from regional warehouses to urban distribution centers. We develop a data-driven approach to optimize the middle-mile truck capacity assignment.

093-2062 Supply Chain Coordination with Multiple Shipments: The Optimal Inventory Subsidizing Contracts

Shi Chen, Assistant Professor, Foster School of Business, United States
Hau Lee, Professor, Graduate School of Business, United States
Kamran Moinzadeh, Professor, University of Washington, United States

We study a supply chain where the retailer places an order and the supplier delivers multiple shipments in the season. We derive the optimal quantity and timing decisions of the retailer, as well as an incentive contract with either a direct inventory subsidizing scheme or a delayed payment scheme.

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

Invited Session: Supply Chain and Revenue Management

Chair(s): Tamar Cohen-Hillel

093-0753 Multi-Product Price Optimization Under a General Cascade Click Model

Xiangyu Gao, Assistant Professor, The Chinese University of Hong Kong, Hong Kong
Stefanus Jasin, Associate Professor, University of Michigan, United States
Sajjad Najafi, Post Doc/Researcher, University of Michigan, United States
Huanan Zhang, Assistant Professor, Penn State University University Park, United States

We consider a pricing problem for a set of products displayed on a list. We assume a general cascade click model. We first study the optimization problem where the firm knows all problem parameters and then study the joint learning and optimization problem where the information is unknown a priori.

093-1343 Ambiguity, Contracts, and Stocking Decisions

Wedad Elmaghraby, Professor, University of Maryland, United States
Anna Devlin, Assistant Professor, Drexel University, United States
Rebecca Hamilton, Professor, Georgetown University, United States

We propose that ambiguity aversion is one potential reason why retailers are reluctant to stock new products. In a series of experiments, we demonstrate that changing the form of contract offered to the retailer decreases a retailer's aversion to ambiguity.

093-1965 On the Power of Bounded Memory Peak End Demand Models

Tamar Cohen, Student, Massachusetts Institute of Technology, United States
Kiran Panchamgam, Senior Scientist, Oracle, United States
Georgia Perakis, Professor, Massachusetts Institute of Technology, United States

Consider the problem of promotion planning, with bounded-memory-peak-end demand. We show that the optimal promotion policy requires at most two price levels and we find the structure of the optimal pricing policy. In the cases where the demand was misclassified, we provide an analytical bound on the estimation error.

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

Contributed Session: Behavioral Issues in Supply Chain Management (2)

Chair(s): Tarun Jain

093-0103 Service Order Allocation Under Demand Uncertainty: Risk, Competition, and Relationship

Di Wang, Student, Tianjin University, China

Weihua Liu, Professor, Tianjin Uinversity, China

From the practice of Tianjin Port, we find that order allocation under uncertain demand is related to risk aversion, peer competition, and relationship strength. This paper proposes "offset effect", “amplification effect", and "equilibrium effect", among the factors and puts forward a mechanism of "incentive upgrade and cost sharing" accordingly.

093-1177 Effect of Competition Parameters on Suppliers’ Behavior in Outsourcing via Competition

Mohsen Ahmadian, Student, University of Massachusetts Boston, United States
Ehsan Elahi, Associate Professor, University of Massachusetts Boston, United States
Roger Blake, Associate Professor, University of Massachusetts Boston, United States

This research uses the results of controlled laboratory experiments in which subjects play the role of suppliers competing for the business of a buyer. We find that subjects behave differently depending on the criteria for competitions the buyer specifies. We evaluate both context-dependent and context-independent factors to explain the differences.

093-1171 Gamesmanship Behavior in Supply Chain Outsourcing via Competition

Mohsen Ahmadian, Student, University of Massachusetts Boston, United States
Ehsan Elahi, Associate Professor, University of Massachusetts Boston, United States
Roger Blake, Associate Professor, University of Massachusetts Boston, United States

This study aims to experimentally investigate the suppliers' behavior in an outsourcing competition. We find the "gamesmanship behavior", which is defined as players' tendency to beat their competitors rather than maximizing their own profits, can explain the differences between the experimental results and the theoretical predictions.

093-0589 Capacity Reservation Under Overconfident Buyer and Suppliers

Tarun Jain, Assistant Professor, Indian Institute Of Management, Udaipur, India
Jishnu Hazra, Professor, Indian Institute of Management Bangalore, India
T.C.E. Cheng, Professor, The Hong Kong Polytechnic University, China

It is observed that humans are overconfident about the estimates of uncertain outcomes. We study a model with overconfident buyer and suppliers where the buyer decides the capacity to be reserved and the size of the supply base. Suppliers participate in the bidding competition. We present several practical insights.

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

Invited Session: Innovation at the Edges

Chair(s): Joel Wooten

093-1460 From Fly Fishing to Dragnets: How Digital Design Tools Are Changing Innovation Work

Sebastian Fixson, Professor, Babson College, United States
Tucker Marion, Associate Professor, Northeastern University, United States

Digital design and fabrication tool performance has increased dramatically in recent years, but their effect on the NPD process has been primarily focused on increasing efficiency. In this paper, we study how recent developments, such as generative design, are fundamentally altering the role the human innovator plays in the process.

093-1823 Dynamic Innovation Contests and Information Design

Sina Moghadas Khorasani, Student, University of Utah, United States

To sustain maximal incentives in a two-stage innovation contest, I introduce a simple history-dependent award structure and a novel information disclosure policy whereby information is revealed only probabilistically over time and only when strictly needed.

093-1360 The Benefits of Learning from Failure in the Medical Device Industry

Jennifer Bailey, Assistant Professor, Babson College, United States

We consider the different benefits of learning from failure experience. We examine this phenomenon in the context of learning from product recalls in the medical device industry.

093-1097 Non-Audacious Field Experiments - The Case for Small Studies

Joel Wooten, Assistant Professor, University of South Carolina, United States

We think of field experiments as big, expensive undertakings. I make the case for smaller real-world experiments by highlighting some recent work with baseball teams and grocers.

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

Invited Session: Stochastic Models for Inventory Management

Chair(s): Zumbul Atan

093-0708 Expediting in Two-Echelon Spare Parts Inventory Systems

Melvin Drent, Student, University of Luxembourg, Luxembourg
Joachim Arts, Associate Professor, University of Luxembourg, Luxembourg

We consider an inventory system for repairable items. The repair of failed parts may be expedited. We seek to minimize investment costs under availability and expediting constraints. For this problem, we develop two solution approaches and we present managerial insights based on a case study at the Dutch Railways.

093-0835 Operational Spare Parts Planning for Service Control Towers

Ayse Sena Eruguz, Assistant Professor, Erasmus University Rotterdam, Netherlands
Rommert Dekker, Professor, Erasmus University Rotterdam, Netherlands

In Service Control Towers, real-time supply chain information are monitored. In this talk, we discuss how to use this information in operational spare parts planning under a finite-horizon service-level agreement. The objective is to determine operational interventions (e.g., expediting, stock reallocation) that minimize the expected total cost.

093-0862 Retailer Inventory Control with Shelf Space and Backroom Considerations

Zumbul Atan, Assistant Professor, Eindhoven University of Technology, Netherlands
Murat Ercan, Student, Eindhoven University of Technology, Netherlands
Nesim Erkip, Professor, Bilkent University, Turkey
Tom Van Woensel, Professor, Eindhoven University of Technology, Netherlands

In practice, retailers can store surplus stock, which does not fit on the shelves, in a backroom. We provide models to assist retailers with their replenishment decisions while taking into account the availability of backrooms and the shelf space, lead time, and case pack size restrictions.

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

Invited Session: Services for Healthy Prospect

Chair(s): Jie Zhang

093-0438 The Impact of Process and Service Standardization on Operational Performance in Nursing Homes

Lu Kong, Student, Cornell University, United States
Kejia Hu, Assistant Professor, Vanderbilt University, United States
Rohit Verma, Professor, Cornell University, United States

Analyzing data of more than 30,000 U.S. nursing homes over 15 years, we found a customization trend in terms of staffing ratio and a standardization trend in terms of the service offering. We further explore the relationship of process standardization, service standardization, and outcome standardization in nursing home settings.

093-2166 There's No Place Like Home? The Impact of Location and Caregiver Fulfillment on Senior Care

Matthew Walsman, Assistant Professor, Rutgers Business School, United States
David Dobrzykowski, Associate Professor, Bowling Green State University, United States
Michael Lewis, Professor, University of Bath, United Kingdom

Using data from the Federal Money Follows the Person program, we discover that seniors who move out of nursing homes into the community are more satisfied, while reporting better care and less loneliness. Further, caregivers who give better care are more fulfilled in their work, leading to less senior loneliness.

093-1804 Exploring Triadic Service Continuity in Home Support Services

Jie Zhang, Assistant Professor, University of Victoria, Canada
Linda Shi, Associate Professor, University of Victoria, Canada

Triadic service relationship forms in distributed service settings is when an employee travels to a client's home and provides services on behalf of the service organization. This study explores how the quality of external relationship and internal governance mechanisms may impact the continuity of home support services.

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Sunday, 08:00 AM - 09:30 AM, Monroe Track: Purchasing and Supplier Management

Invited Session: Topics in crowdsourcing

Chair(s): Damian Beil Yan Huang

093-0879 The Role of Problem Specification in Crowdsourcing Design Contests: A Theoretical and Empirical Analysis

Zoey Jiang, Student, University of Michigan, United States
Yan Huang, Assistant Professor, Carnegie Mellon University, United States
Damian Beil, Professor, University of Michigan, United States

We investigate the role of seekers' problem specifications in crowdsourced design contests. We propose and empirically test a game-theoretic model featuring different types of information in problem specifications and corresponding designer decisions. We find that seekers should only specify a moderate number of conceptual objectives, while providing maximal execution guidance.

093-1022 When to Involve In-House Suppliers in Procurement Contests

Zhi Chen, Student, INSEAD, Singapore
Jurgen Mihm, Associate Professor, INSEAD, France
Jochen Schlapp, Associate Professor, Frankfurt School of Finance & Management, Germany

One of the central questions in the strategic procurement of innovative goods is whether a buyer should own a stake in a critical supplier or not. In this study, we analyze when a buyer should source from external suppliers exclusively and when it should (partially) own one of the suppliers.

093-1374 Optimal Duration of Innovation Contests

C. Gizem Korpeoglu, Assistant Professor, University College London, United Kingdom
Ersin Korpeoglu, Assistant Professor, University College London, United Kingdom
Sıdıka Tunç, Student, UCL School of Management, United Kingdom

We study optimal duration and award scheme of an innovation contest where an organizer elicits innovative solutions from agents. We find that the primal contest duration increases with novelty and sophistication of solutions that an organizer seeks, and that an organizer with low urgency should give multiple awards.

093-1831 Reputation and Manipulation in Social Networks

Mohamed Mostagir, Assistant Professor, University of Michigan, United States

Can a principal (e.g. a firm or a news outlet) repeatedly provide poor service to agents and yet maintain a positive reputation? We answer this question in a social learning environment and give conditions under which the principal can or cannot manipulate a population.

373

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

Invited Session: Structural Estimation in OM

Chair(s): Yannis Stamatopoulos

093-0063 Manufacturing and Regulatory Barriers to Generic Drug Competition

Yixin Iris Wang, Assistant Professor, University of Illinois Urbana-Champaign, United States
Jun Li, Assistant Professor, University of Michigan Ann Arbor, United States
Ravi Anupindi, Professor, University of Michigan Ann Arbor, United States

Understanding the drivers of market concentration in the generic pharmaceutical industry is essential to guaranteeing the availability of low-cost generics. In this paper, we develop a structural model to capture the multiple determinants governing manufacturers' entry decisions and conduct policy simulations to give insight into regulatory policies.

093-0430 Economies of Scope in Reverse Auctions: An Application to Road Salt Procurement

Diwakar Gupta, Professor, University of Texas Austin, United States
Matt Schmitt, Assistant Professor, University of California Los Angeles, United States
Yannis Stamatopoulos, Assistant Professor, University of Texas Austin, United States

We use data from procurement auctions for road salt in Minnesota to explore the implications of potential interlinkages between auctions. We find that observed bids are highly consistent with the presence of such interlinkages and quantify the associated impact on bidding behavior.

093-0443 Estimating Operational Costs of Changing Prices

Soheil Ghili, Assistant Professor, Yale University, United States
Yannis Stamatopoulos, Assistant Professor, University of Texas Austin, United States

We use a "revealed preference" estimation approach together with detailed quasi-experimental data to estimate price-adjustment costs in brick-and-mortar retail. Our approach and unique data allows us to disentangle physical price adjustment costs from managerial ones as well as fixed costs of price adjustments from variable ones.

093-0476 Optimizing Size and Variety in Online Platforms

Abhinav Sinha, Post Doc/Researcher, Columbia Business School, United States
Yash Kanoria, Assistant Professor, Columbia University, United States
Fanyin Zheng, Assistant Professor, Columbia University, United States
Zhenyu Lai, Director, Wayfair, United States

Using data from Wayfair, a large home goods e-retailer, we estimate a discrete choice model that incorporates the choice paralysis consumers face when there are too many products. From this, we infer optimal assortment size and variety on the platform. We also run an experiment to validate our model.

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Sunday, 08:00 AM - 09:30 AM, Jefferson East — Track: Retail Operations

Invited Session: Models for Omni-Channel Retailing

Chair(s): Bahriye Cesaret

093-0150 Modeling Retail Store and Online Channel Allocation Decisions for Multiple Items

Roshanak Mohammadivojdan, Student, University of Florida, United States
Joseph Geunes, Professor, Texas A&M University College Station, United States

We consider a multi-product retailer who sells items via both a retail store and an online channel. Our goal is to propose a stylized mathematical program to simultaneously model product assortment and channel allocation decisions, in order to gain insights on key decision drivers and characteristics of optimal decisions.

093-0294 How Do Country Characteristics Affect Cross-Border E-Commerce Sales in Europe? An Empirical Study

Zohreh Khooban, Student, Eindhoven University of Technology, Netherlands
Nevin Mutlu, Assistant Professor, Technische Universiteit Eindhoven, Netherlands
Sarah Gelper, Assistant Professor, Eindhoven University of Technology, Netherlands
Ton De Kok, Professor, Eindhoven University of Technology, Netherlands

In this research, we conduct an empirical study to uncover the factors that explain the cross-border e-commerce shopping behavior of consumers within the European Union. We examine how country characteristics at the economic, regulatory, and cultural levels moderate the effects of individual-level drivers of cross-border sales using a unique dataset.

093-1336 Understanding Demand Using Choice Modeling in an Omni-Channel Environment

Burcu Keskin, Professor, University of Alabama, United States
Jia Guo, Student, University of Alabama, United States

We study the role of a physical store for an online-first retailer considering expanding into omni-channel retailing. Specifically, we consider the increased profits from newly acquired demand and the increased fulfillment costs from cannibalized demand. We build stylized models to estimate the effect of customer's purchasing behavior on the retailer's choices.

093-0043 Order Fulfillment Policies for Ship-from-Store Implementation in Omni Channel Retailing

Bahriye Cesaret, Assistant Professor, Ozyegin University, Turkey
Armagan Bayram, Assistant Professor, University of Michigan-Dearborn, United States

We investigate dynamic fulfillment decisions in ship-from-store implementation, specifically from which location to fulfill an online order. We incorporate the uncertainty both in demand and in the cost of shipment to individual customers. We develop a stochastic dynamic framework and present some analytical and numerical findings on optimal fulfillment strategies.

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375 Sunday, 08:00 AM - 09:30 AM, Jefferson West Track: Sustainable Operations

Contributed Session: Carbon Emissions & Governance

Chair(s): Birasnav Muthuraj

093-0703 An Empirical Understanding of Factors Influencing Carbon Footprint Reduction in Supply Chains

Santosh Mahapatra, Associate Professor, Clarkson University, United States
Tobias Schoenherr, Professor, Michigan State University, United States
Jayanth Jayaram, Professor, University of South Carolina, United States

In recent years firms have been focusing on carbon footprint reduction to address climate change and economic concerns. Using secondary data from the reports published by CDP (formerly the "Carbon Disclosure Project"), we investigate the motivations and approaches for carbon footprint reduction efforts and their consequences.

093-0901 Combined Inventory and Routing Problem with Green Factors

Carlos Franco, Student, Universidad del Rosario, Colombia
Eduyn López-Santana, Student, Universidad Distrital Francisco José de, Colombia

This works aims to present an optimization model for the Green Inventory Routing Problem in which the enviromental effect is modeled as a fuzzy number to include the uncertainty in emissions in the routing process. Some analyses are performed to evaluate the impact of including the green metrics.

093-1887 Antecedents and Outcomes of Implementing Environmental Management Practices in American Hotels: A literature Review

Birasnav Muthuraj, Assistant Professor, New York Institute of Technology, United States
Joshua Bienstock, Assistant Professor, New York Institute of Technology, United States

There is extensive literature addressing the implementation of environmental practices to reduce carbon footprints. However, no studies have been conducted to examine the antecedents and outcomes of these practices. Our study will explore existing literature to identify the various factors that would guide American hotels in improving their environmental performance.

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376 Sunday, 08:00 AM - 09:30 AM, Georgetown East Track: Supply Chain Risk Management

Invited Session: Anti-counterfeiting Supply Chain Strategies

Chair(s): Morteza Pourakbar

093-0090 The Enemies from Within: When Your Supplier Produces a Copycat of Your Product

Hubert Pun, Associate Professor, University of Western Ontario, Canada
Greg Critchley, Student, University of Western Ontario, Canada
Salar Ghamat, Assistant Professor, Lazaridis School of Business & Economics, Canada
Pengwen Hou, Student, Tianjin Uinversity, China

We examine a system where a manufacturer outsources to a supplier. The supplier and a third-party firm decide whether or not to enter with a copycat while the manufacturer selects the level of investment. The manufacturer can eliminate the threat of a copycat from the supplier by signing an IP agreement.

093-1428 A Comprehensive Design of Extended Warranties with Considering Hardware, Software and Users Interplay

Ming Luo, Lecturer, University of Huddersfield, United Kingdom

Many products consist of hardware and software. The causes of warranty claim can be errors of hardware, software, and users. Selling extended warranties is also influenced by products' performance and users' behaviours. A comprehensive design is needed to maximize profit and reduce risk while considering the interplay of these factors.

093-0729 Combating Strategic Cross-Border Counterfeiters: Public and/or Private Responsibility?

Xishu Li, Assistant Professor, Erasmus University Rotterdam, Netherlands
Morteza Pourakbar, Associate Professor, Rotterdam School of Management, Netherlands

Recently, we have seen a number of public-private partnerships, in which information is shared between governmental authorities and private enterprises, being formed to combat counterfeiting at the borders. We study when forming such a partnership, which party should be responsible for the investment in the infrastructure.

093-0171 Strategies to Combat Refurbished Counterfeit Products

Morteza Pourakbar, Associate Professor, Rotterdam School of Management, Netherlands
Paolo Letizia, Assistant Professor, University of Tennessee Knoxville, United States
Mohammad Nikoofal, Assistant Professor, Ryerson University, Canada

Reports suggest that retrieving used cores is among the most popular strategies among counterfeiters to extract the components and parts needed to produce refurbished counterfeits. We investigate how OEM's collection, pricing, and quality strategies should be set in the presence of counterfeiters.

Sunday, 08:00 AM - 09:30 AM

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Sunday, 08:00 AM - 09:30 AM, Georgetown West Track: Teaching/Pedagogy in POM

Invited Session: Tutorial: Games and Experiential Learning in Supply Chain Management

Chair(s): Yao Zhao

093-2372 Games and Experiential Learning in Supply Chain Management

Yao Zhao, Professor, Rutgers University, United States

I showcase two competitive supply chain games: Hunger Chain, to simulate the Newsvendor model, shortage gaming (panic orders, hoarding) and the Prisoners' Dilemma; Flora-Park, to simulate the competition among supply chains, where firms must collaborate to win the competition and meanwhile watch out for themselves.

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

Invited Session: Business Models in the Sharing Economy

Chair(s): Ioannis Bellos

093-0151 Manufacturer's Entry in the Product-Sharing Market

Baojun Jiang, Associate Professor, Washington University St Louis, United States
Lin Tian, Associate Professor, Fudan University, China
Yifan Xu, Professor, Fudan University, China

This paper develops an analytical framework to study a manufacturer's optimal B2C rental service and retail pricing decisions in a market where consumers who buy the manufacturer's product may, during periods of low self-use values, share the product with other consumers in a product-sharing market.

093-1050 Psychological Overage and Underage Costs in Three-Part Tariff Plans: Evidence from Bike-Sharing Economy

Brian Park, Assistant Professor, Georgia State University, United States
Eunhee Sohn, Assistant Professor, Georgia Institute of Technology, United States
Necati Tereyagoglu, Assistant Professor, Georgia Institute of Technology, United States

Using individual-level riding data from a bike-sharing company, we show that not only the usage above free allowable units, but also ending the usage earlier than what is allowed after the paid penalty, determines customers' riding decisions in a three-part tariff pricing plan.

093-2101 Doing Well by Doing Good to Others: The Operational Incentives of Charitable Giving

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

We consider a for-profit firm sells non-perishable products in its primary market over time and meanwhile decides whether to participate a product donation program. We explore the operational incentives for a firm to participate a product donation program at zero margin.

093-2183 Fleet Refresh Decisions in Car-Sharing Business Models

Vishal Agrawal, Associate Professor, Georgetown University, United States
Ioannis Bellos, Assistant Professor, George Mason University, United States
Ximin Natalie Huang, Assistant Professor, University of Minnesota, United States

We study how car-sharing service offerings should be managed along with product sales. We focus on an important decision, namely how often to refresh the car-sharing fleet, as it influences both the primary and secondary market. We also explore these decisions for a third-party car sharing provider competing with sales.

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

Invited Session: Economic Models in Supply Chain Management

Chair(s): Jiaru Bai

093-1500 When Do Firms Benefit From Competition?

Yiqi Sun, Student, Tsinghua University, China
Zhengping Wu, Associate Professor, Syracuse University, United States
Wanshan Zhu, Associate Professor, Tsinghua University, China

This talk considers the optimal decisions of firms under joint price and lead-time competition and examines the impact of competition on firm profit. Surprisingly, we find that firms can benefit from competition under certain parametric conditions.

093-2079 Evolution of Ride Services

Daehoon Noh, Student, University of Maryland, United States
Tunay Tunca, Professor, University of Maryland, United States
Yi Xu, Associate Professor, University of Maryland, United States

Ride services bring together drivers and customers in two-sided matching markets. As these services mature multiple competing operational models emerge. In this paper, we utilize a multi-stage multi-firm model to analyze the competition between different ride service models. We identify the factors that determine pricing and shaping of market segmentation.

093-0558 Explaining Suppliers' Decisions Through Vendor-Managed Inventory

Roel Post, Student, University of Groningen, Netherlands
Paul Buijs, Assistant Professor, University of Groningen, Netherlands
Jaap Wieringa, Professor, University of Groningen, Netherlands
Hans Wortmann, Professor, University of Groningen, Netherlands

Jan Fransoo, Professor, Kuehne Logistics University, Germany

With the introduction of Vendor-Managed Inventory (VMI), the inventory management responsibility is transferred from a retailer to its supplier(s). In this study, we use transaction data from a large European retailer to explain performance differences across VMI suppliers based on characteristics of suppliers' products, assortment and organizations.

093-1412 Can Multiple On-Demand Service Platforms Coexist?

Jiaru Bai, Assistant Professor, Wake Forest University, United States

Christopher Tang, Professor, University of California Los Angeles, United States

As venture capital firms are financing on-demand service platforms, we wonder how many startups of this kind can survive in a competitive market. To examine this question, we present a model in which two on-demand service platforms compete in both the provider and customer markets.

Sunday, 09:45 AM - 11:15 AM

381 Sunday, 09:45 AM - 11:15 AM, Piscataway — Track: Energy Supply Chains

Invited Session: Sustainability and Energy Supply Chains

Chair(s): Chunguang Bai

093-2111 Challenges to Supply Chain Sustainability Transparency

Simonov Kusi-Sarpong, Assistant Professor, University of Portsmouth, United Kingdom
Himanshu Gupta, Associate Professor, Adani Institute of Infrastructure Management, India
Chunguang Bai, Professor, School of Management and Economics University of Electronic Science and Technolo, China
Sharfuddin Khan, Student, Industrial Engineering and Engineering Management Department University of Shar, United Arab Emirates
Francis Arhin, Student, University of Bolton, United Kingdom

The purpose of the paper is to propose a framework of barriers that can hinder supply chain sustainability transparency implementation in the manufacturing supply chains and determine the interactions amongst these barriers as well as prioritize them on the basis of their severity.

093-2114 Product Service Systems and Renewable Energy Adoption in Emerging Economies

Sherwat Ibrahim, Associate Professor, American University In Cairo, Egypt
Farid Kandeel, Associate Professor, Maastricht University, Netherlands

This paper investigates the benefits of using Product Service Systems (PSS) in adopting new technologies related to renewable energy sources in an emerging economy setting. This study measures the effects of PSSs on priori belief, policy preferences, and technology risk attitude towards adopting solar energies in Egypt.

093-2237 Sizing, Bio, Wind and Solar Energy to Minimize Storage Requirements

Jan Eise Fokkema, Student, Rijksuniversiteit Groningen, Netherlands
Martin Land, Associate Professor, University of Groningen, Netherlands

Combining the different production profiles of bio, wind, and solar energy enables reducing storage requirements. We address the sizing and energy allocation decisions of bio, wind, and solar energy sources and examine the trade-off between overcapacity and normal capacity in terms of curtailment and required storage size.

093-0686 Decentralized Production, Storage, and Retail of Electricity in a European Market System

Philipp Weidinger, Student, Chair of Management Accounting, Germany
Peter Letmathe, Professor, Rwth Aachen University, Germany

With energy transition, electricity markets face different challenges such as changing market structure, decentralized small and medium sized power plants which depend on external factors, and needed storage. To ensure reliable power supply, this presentation evaluates different production and operations management strategies, and analyzes the market feasibility in a competitive environment.

093-2128 A Model for the Water, Energy, Food and Sustainability Nexus Decision Environment

Chunguang Bai, Professor, University of Electronic Science and Technology of China, China
Joseph Sarkis, Professor, Worcester Polytechnic Institute, United States

This paper provides a conceptual and holistic framework for considering the WEFS nexus in relation to sustainability concerns for making decisions more effective.

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

Contributed Session: Ratings, Reviews and Competition

Chair(s): Fang Fang

093-1975 Product-Driven Algorithms for Eliciting Product Recommendation

Jonathan Amar, Student, Massachusetts Institute of Technology, United States
Chaithanya Bandi, Assistant Professor, Northwestern University, United States
Nikos Trichakis, Associate Professor, MIT, United States

We develop a novel question-design framework in order to improve product recommendation. Our algorithm is based on accurately estimating the differences of utilities. Our formulation is driven by available assortment, and therefore achieves better performance. We provide theoretical justification and experimental analysis to prove the efficiency of our methods.

093-0423 Data Envelopment Analysis for Rating of Smart Phones

Godwin T, Professor, IIM Tiruchirappalli, India

The ever-growing options of smart phones in the market has only made it difficult for a prospective customer to choose one. A data envelopment analysis approach is used to come up with a rating for each smart phone under consideration that can be eventually used by prospective customers to choose one.

093-2217 Effect of Product Ratings & Reviews on Sales of Products on E-Commerce Websites

Anjali Andhare, Student, National Instituteof Industrial Engineering, Mumbai, India
Vivekanand Khanapuri, Professor, National Instituteof Industrial Engineering, Mumbai, India

Online consumer Reviews and Ratings Systems of e-commerce websites provide product information, evaluation, authentication and consumer's perspective. Textual and sentiment analysis using R programming for 4 categories: Electronics, Evergreen, Niche and Trending products reveal that reviews affect sales most for introductory and star ratings influence products in growth stage.

093-0463 The Market Forces Behind Digital Transformation in Manufacturing

Sabine Baumann, Professor, Jade University, Germany

Extensive structural disturbances fundamentally challenge value creation approaches in manufacturing. We use case studies from a variety of industries to analyze consequences of digital disruption for business models while raising questions about data measurement and ownership, value creation, and appropriation as well as the new rules of the game.

093-0254 Block Ownership in Vertical Relationships in the Presence of Downstream Competition

Fang Fang, Assistant Professor, CAL STATE LOS ANGELES, United States
Baojun Jiang, Associate Professor, Washington University St Louis, United States
Jiong Sun, Assistant Professor, Purdue University, United States

We study the economic impacts of partial vertical ownership (PVO) in the presence of downstream competition and its impact on consumer surplus. We show that both the acquiring and target firms prefer an intermediate size of PVO and consumers may get hurt in PVO by a low-valuation retailer.

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Sunday, 09:45 AM - 11:15 AM, Northwest — Track: Information Systems and Operations Management

Contributed Session: IS, OM and organizational issues

Chair(s): Ning Wei

093-0455 Determinants of User Acceptance of Mobile Social Payment Apps

Huiqin Yang, Student, Peking University, China

Mobile apps which combine mobile payment and social network function together have gained wide popularity. By taking into consideration of the TAM model and network externality, we did an empirical and comparative study on Alipay and Wechat to investigate the factors that impact user acceptance of mobile social payment apps.

093-0913 The Effect of Organizational Design on Exploiting Complementarities

Anitesh Barua, Professor, The University of Texas at Austin, United States
Genaro Gutiérrez, Associate Professor, The University of Texas at Austin, United States
Changseung Yoo, Assistant Professor, McGill University, Canada

Using a naturally occurring experiment, we empirically investigate how a firm's organizational design (centralized vs decentralized decision making) can affect its ability to exploit synergies among business practices in the context of online advertising.

093-0712 Perpetual or Subscription Licensing? Optimal Pricing Strategy for Information Goods in a Platform Ecosystem

Ning Wei, Student, Tianjin University, China
Junpeng Guo, Professor, Tianjin University, China
Wenhua Li, Associate Professor, Tianjin University, China

Companies of cloud computing and mobile apps have built their software platform ecosystem to serve both third-party developers and consumers. In this study, we develop a game-theoretical model to analyze whether the platform should motivate third-party developers to use subscription strategies rather than selling perpetual licenses.

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Sunday, 09:45 AM - 11:15 AM, Morgan — Track: Public Sector Operations Management

Invited Session: Education and new technology

Chair(s): Soheil Sibdari

093-1842 Mechanisms that Affect Programming Performance in a Diverse Undergraduate Population

Sara Hooshangi, Associate Professor, George Washington University, United States
Subhasish Dasgupta, Associate Professor, George Washington University, United States

This study seeks to identify mechanisms that affect programming performance in a sample of diverse undergraduate students. We first assess the effects of age, gender, and race on programming performance. We then explore incremental predictive power of cognitive variables such as goal orientation and technology self-efficacy as possible explanatory mechanisms.

093-1832 Access and Success-Broadening Educational Opportunities in the Computing and Information Science Fields

Sara Hooshangi, Associate Professor, George Washington University, United States

This talk will demonstrate effective strategies used in practice to increase the retention of students from historically underrepresented groups in the information and computing fields. We will show the success of a cohort-based program with peer-based activities, ongoing mentorship, and active engagement where 90% of students graduate on time.

093-1974 The Impact of a Neighborhood's Socioeconomic Status on Hospital Readmission in the Washington D.C. Metropolitan Area

Sara Hooshangi, Associate Professor, George Washington University, United States
Soheil Sibdari, Associate Professor, University of Massachusetts Dartmouth, United States

The relationship between hospital readmission rate and a neighborhood's socioeconomic status is an interesting question to healthcare policy-makers. In this study, we will compare the rate of readmission in various Washington D.C. metropolitan area hospitals and try to address the differences seen in more affluent versus disadvantaged neighborhoods.

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Sunday, 09:45 AM - 11:15 AM, Jay — Track: Emerging Topics in Operations Management

Invited Session: Decision Support Systems for Scheduling and Logistics

Chair(s): David Bergman Mohsen Emadikhiav

093-0872 Designing Electronic Markets for Transportation Services

Soohyun Cho, Assistant Professor, Rutgers University, United States

Arim Park, Student, Rutgers University, United States
Mark Rodgers, Assistant Professor, Rutgers Business School, United States
Yao Zhao, Professor, Rutgers University, United States

We would like to design an efficient mechanism for an electronic market of transportation services (trucking) in Korea. Under such a market mechanism, shippers get what they pay for (best services at the lowest price) and all service providers (truckers), large or small, have an equal chance to compete.

093-1073 Parcel Delivery by Vehicle and Drone: Modeling and Insights

Amro El-Adle, Student, University of Massachusetts Amherst, United States
Ahmed Ghoniem, Associate Professor, University of Massachusetts Amherst, United States
Mohamed Haouari, Professor, Old Dominion University, United States

We investigate the traveling salesman problem with drones (TSP-D) in which customers may be served either by the vehicle or by a portable drone launched from the vehicle. We develop a 0-1 mixed-integer program (MIP) that synchronizes vehicle and drone operations to minimize the duration of the carriers' tours.

093-1937 Dynamic Scheduling of Home Health Care Patients to Medical Providers

Andre Cire, Assistant Professor, University of Toronto, Canada
Adam Diamant, Assistant Professor, York University, Canada

We propose a dynamic scheduling framework to assist in the assignment of patients to home care practitioners. Our approach consists of a one-step policy improvement methodology that incorporates supervised learning techniques to predict future practitioner allocations. Results of our policy are presented for a Canadian home agency.

093-1458 Sensor Data Analytics for Sustainable Transportation: Collaboration in the Trucking Industry

David Bergman, Assistant Professor, University of Connecticut, United States
Sudip Bhattacharjee, Professor, University of Connecticut, United States
Robert Day, Associate Professor, University of Connecticut, United States
Mohsen Emadikhiav, Student, University of Connecticut, United States

We develop an end-to-end model of information extraction from telematics sensor data to create backhaul opportunities for multiple carriers in a centralized decision support system. We discuss how the identified opportunities can be utilized to create economic, environmental, and social benefits for the participants in our carrier collaboration framework.

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Sunday, 09:45 AM - 11:15 AM, Holmead East Track: Global Supply Chain Management

Invited Session: Innovative Strategies in Supply Chain Management

Chair(s): Ming Zhao

093-0167 Entrepreneurial Market Research - When Hypotheses Outnumber Samples

Evgeny Kagan, Assistant Professor, Johns Hopkins University, United States
William Lovejoy, Professor, University of Michigan - Ann Arbor, United States
Stephen Leider, Assistant Professor, University of Michigan Ann Arbor, United States

Innovation often begins with a raw technology that can be applied in a wide range of industrial settings. This paper formulates a bandit model to study the search for a market/application for new technologies, investigates the performance of traditional search strategies, and develops several new high-performing strategies.

093-0956 Control and Valuation of Storage Resources for Distinct Services Under Random Operation Permissions

Somayeh Moazeni, Assistant Professor, Stevens Institute of Technology, United States
Boris Defourny, Assistant Professor, Lehigh University, United States

This talk discusses revenue-maximizing storage resources offering distinct services: inventory management and facility sharing. These services have heterogeneous characteristics and stochastic revenues. Opportunities to provide services are only permitted at exogenous random times. We investigate and compare optimal strategies and profitability of capacity sharing under various market access assumptions.

093-1384 Transshipment Problem: Cluster or Not?

Burcu Keskin, Professor, University of Alabama, United States
Emily Barbee, Student, University of Alabama, United States

We investigate a bi-directional transshipment problem among a large network of physical stores. Specifically, we investigate clustering approaches for effective transshipment. Using a large grocery retailing data set with multi-products across two large and closely located metropolitan areas, we derive product level, retailer level, and supplier level insights.

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Sunday, 09:45 AM - 11:15 AM, Holmead West Track: Retail Operations

Invited Session: Demand estimation in retail operations

Chair(s): Ashwin Venkataraman

093-0083 A Choice Modeling Framework for Service Time Windows

Adam Elmachtoub, Assistant Professor, Columbia University, United States
Xiao Lei, Student, Columbia University, United States

On-demand services have become increasingly common and service providers now offer long overlapping time windows with rewards to reduce service costs. We provide a choice modeling framework to address how customers choose among time windows of various lengths and apply this framework to evaluate different strategies for time window design.

093-1390 Irrational Behavior Modeling and Decision Making

Velibor Misic, Assistant Professor, University of California Los Angeles, United States
Yi-Chun Chen, Student, UCLA Anderson School of Management, United States

In this talk, we study a new choice model that relaxes the weak rationality assumption and can model a wider range of customer behavior, such as anchoring effects between products. We develop efficient learning and optimization procedures, and show the benefits of our approach on synthetic and real data.

093-1586 Machine Learning in Demand Estimation with Long Tail Data

Pu He, Student, Columbia University, United States
Fanyin Zheng, Assistant Professor, Columbia University, United States

Long tail distributions in sales or market share data have long been an issue in empirical studies in areas such as economics, operations, and marketing. We introduce a new two-stage estimator utilizing ML algorithms to correct the selection bias introduced by traditional demand estimation when facing long-tail data.

093-0271 A Conditional Gradient Approach for Nonparametric Estimation of Mixing Distributions

Srikanth Jagabathula, Associate Professor, New York University, United States
Lakshminarayanan Subramanian, Associate Professor, New York University, United States
Ashwin Venkataraman, Post Doc/Researcher, Harvard University, United States

A key challenge in estimating mixture models is that the mixing distribution is often unknown and imposing apriori parametric assumptions can lead to model misspecification issues. We propose a new methodology for nonparametric estimation of the mixing distribution by formulating the likelihood-based estimation problem as a constrained convex program.

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389 Sunday, 09:45 AM - 11:15 AM, Gunston East Track: Humanitarian Operations and Crisis Management

Invited Session: Humanitarian Operations in Latin America (1)

Chair(s): Adriana Leiras

093-1362 Participation of the Port Community in Operations of Humanitarian Logistics in Paita Port

Irineu Brito Jr, Professor, Universidade Estadual Paulista Julio De Mesquita Filho - Unesp, Brazil
Mario Chong, Professor, Universidad del Pacífico, Peru
Juan Lazo, Professor, Universidad del Pacífico, Peru
Gabriela Maravi, Assistant Professor, Universidad del Pacífico, Peru

The purpose of this research is to show the importance of the participation of the port community in humanitarian logistics operations, taking into account an integral and collaborative response. The study describes and analyzes the response operations of the "El Niño Costero Phenomenon" carried out from the Port of Paita.

093-1380 Characterization of Venezuelan Migrants in Peru

Irineu Brito Jr, Professor, Universidade Estadual Paulista Julio De Mesquita Filho - Unesp, Brazil
Mario Chong, Professor, Universidad del Pacífico, Peru
Juan Lazo, Professor, Universidad del Pacífico, Peru
Gabriela Maravi, Assistant Professor, Universidad del Pacífico, Peru

The instability in Venezuela has triggered an anthropogenic phenomenon causing the migration of millions Venezuelans. This research characterizes the profile of Venezuelan migrants in Peru. In this regard, a survey with relevant topics such as education, lifestyle, and family was used to obtain relevant information about its reality.

093-2067 Venezuelan Migration in Brazil: A System Dynamics Model for Simulating Effects on Resettlement Policy

Thomas Ribeiro, Student, University of Sao Paulo, Brazil
Irineu Brito Jr, Professor, Universidade Estadual Paulista Julio De Mesquita Filho - Unesp, Brazil
Larissa Ciccotti, Post Doc/Researcher, Universidade de São Paulo, Brazil
Filipe Santos, Student, Universidade de São Paulo, Brazil
Hugo Yoshizaki, Associate Professor, Universidade de São Paulo, Brazil

This paper proposes a dynamic simulation model that seeks to represent the movement of the Venezuelan migrant population in the Brazilian northern state of Roraima before and after the “Acolhida” Operation, which includes the Brazilian government, UN agencies, international organizations and NGOs, as well as its effects on resettlement programs.

093-1699 The Impact of Social Media on the Disaster Economic Assessment

Daniel Eckhardt , Student, Pontifícia Universidade Católica do Rio de Janeiro - PUC-Rio, Brazil
Adriana Leiras, Professor, Pontifícia Universidade Católica do Rio de Janeiro - PUC-Rio, Brazil

Disasters have generated significant direct (damages), indirect (losses), and intangible (non-market costs) economic impacts in the past few years. This study aims to analyze the use of different social media in the disaster response to conduct a disaster economic assessment.

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

Invited Session: Supply Chain Integrity

Chair(s): Vidya Mani

093-0081 The Effect of Visibility on Consumer Trust of Social Responsibility Disclosures

Tim Kraft, Assistant Professor, Sloan School of Management, United States
Leon Valdes, Assistant Professor, University of Pittsburgh, United States

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

According to a 2015 Nielsen Survey, trust is a key factor influencing socially-responsible purchases. At the same time, transparency has been identified as a way to improve consumers' trust of social-responsibility disclosures. We design a human-subject experiment to examine whether and how visibility impacts consumers' trust in companies' social-responsibility communications.

093-0095 Environment-Friendly Practices and Firm Performance: The Role of Proactive Management

Anqi Wu, Student, University of Illinois Urbana-Champaign, United States
Ramanath Subramanyam, Associate Professor, University of Illinois Urbana-Champaign, United States
Gopesh Anand, Associate Professor, University of Illinois Urbana-Champaign, United States

This research examines the performance of pro-environmental management initiatives in firms and the environmental and financial consequences of firm actions. The results suggest a "win-win" paradigm in which firms with a higher quality of proactive environmental management are more likely to achieve better environmental and financial performance.

093-0187 Social Responsibility Auditing of Supply Chain Networks

Han Zhang, Student, Indiana University Bloomington, United States
Goker Aydin, Professor, Johns Hopkins University, United States
Rodney Parker, Associate Professor, Indiana University Bloomington, United States

We study the buyer's problem of auditing its supply network for social responsibility concerns where the network has a general configuration. The buyer suffers economic damages if a violation is exposed at an upstream supplier. We characterize the dynamic auditing strategy and the equilibrium in the production phase.

093-0799 Analyzing Global Supply Chain Risk from Political Conflict

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

In this paper, we combine data on global supplies of goods and commodities, and global political conflict to understand the risk of globalization of supply chains from political and civil conflict. We find that different types of conflict pose differential risk of global supply chain disruptions.

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391 Sunday, 09:45 AM - 11:15 AM, Fairchild East Track: POM in Practice

Invited Session: Decision support for real-life SCM

Chair(s): Ton De Kok Zumbul Atan

093-0975 Operations Strategy Tool for Assessing the Cost-Efficiency Leverage of Additive Manufacturing in Spare Parts

Jakob Heinen, Student, Kuehne Logistics University, Germany
Kai Hoberg, Professor, Kuehne Logistics University, Germany

We propose a tool to decide on the technology choice of spare parts based on supply chain information. We test the tool using a comprehensive dataset for 53,457 spare parts over nine years and find that up to 8% of SKUs could be produced using additive manufacturing (AM).

093-0983 Adaptive Approval of Rare Disease Therapeutics

Tugce Martagan, Assistant Professor, Technische Universiteit Eindhoven, Netherlands
Jan Fransoo, Professor, Kuehne Logistics University, Germany

Expedited R&D programs allow an orphan drug to enter the market while clinical trials are in-progress. This is a new business environment where pharmaceutical companies need to right balance their manufacturing and R&D efforts. We develop a data-driven, Markov decision model to optimize operating decisions under the expedited R&D programs.

093-1424 Revenue Management in Synchromodal Container Transport

Rommert Dekker, Professor, Erasmus University Rotterdam, Netherlands
Bart Vanriessen, Product Manager Digital & Supply Chain Services, ECT Container Terminal Rotterdam, Netherlands
Judith Mulder, Post Doc/Researcher, Erasmus University Rotterdam, Netherlands
Rudy Negenborn, Professor, TUD, Netherlands

Synchromodal container transport allows real-time switching between road, rail, and barge transport. Both rail and barge carry a large number of containers in one trip, yet demand fluctuates a lot. We investigate with a company how many incentives to give for the possibility to delay transport of containers.

093-1668 Controlling Inventories in Omni-Channel Distribution Systems with Variable Customer Order Sizes

Peter Berling, Associate Professor, Lund University, Sweden
Lina Johansson, Student, Lund University, Sweden
Johan Marklund, Professor, Lund University, Sweden

In traditional distribution systems it is optimal to have a low service level at the central warehouse which is not a viable solution in an omni-channel with direct up-stream demand. We present a computationally efficient method to set the reservation level at the central warehouse and re-orderpoints throught the system.

093-1569 Material Coordination in High-Tech Industry

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

High-Tech Industry is characterized by high material complexity and long lead-times of critical parts. Currently, MRP I is used for material coordination. We discuss fundamental flaws in MRP I logic yielding excessive numbers of interrelated and incorrect rescheduling messages. We present an alternative logic and its performance in practice.

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Sunday, 09:45 AM - 11:15 AM, Fairchild West Track: Socially Responsible Operations

Invited Session: Models in Socially Responsible Operations

Chair(s): Yen-Ting Lin

093-0311 Optimal Subsidy Schemes and Budget Allocations for Government-Subsidized Trade-In Programs

Jiaru Bai, Assistant Professor, Wake Forest University, United States
Shu Hu, Lecturer, Ningbo Supply Chain Innovation Institute, China
Luyi Gui, Assistant Professor, University of California Irvine, United States
Rick So, Professor, University of California Irvine, United States
Zujun Ma, Professor, Southwest Jiatong University, China

We study governmental subsidies to trade-in programs to encourage consumers to replace old and outdated products at a faster pace. We analyze the optimal budget allocation among the multiple products covered by the trade-in program and how to most effectively utilize the assigned budget to incentivize product replacement.

093-1437 A Mechanism Design Approach for Medical Surplus Product Allocation

Can Zhang, Assistant Professor, Duke University Durham, United States
Atalay Atasu, Associate Professor, Georgia Institute of Technology, United States
Turgay Ayer, Associate Professor, Georgia Tech, United States
Beril Toktay, Professor, Georgia Institute of Technology, United States

We analyze resource allocation problems faced by medical surplus recovery organizations (MSROs) that recover medical products to fulfill the needs of under-served regions. We propose a mechanism design approach to elicit recipients' private needs information and show that our proposed mechanism significantly improves MSRO's value provision compared with current practice.

093-2121 Implications of Innovative Engineering Design on Closed Loop Supply Chain Coordination

Tolga Aydinliyim, Associate Professor, Baruch College, United States
Eren Cil, Associate Professor, University of Oregon, United States
Nagesh Murthy, Professor, University of Oregon, United States

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

093-1109 Impact of Animal Welfare Regulations on Firms' Product Offerings: Humane or Organic Product

Yen-Ting Lin, Associate Professor, University of San Diego, United States
Yinping Mu, Professor, University of Electronic Science and Technology of China, China
Wenli Xiao, Assistant Professor, University of San Diego, United States

We consider two competing supply chains, each with a supplier and a retailer, and examine the retailers' choices between offering an organic product and a humane product, which provide different improvement in animals' living conditions and nutritional benefits. We also study the impact of government subsidies.

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

Contributed Session: Supply-Chain Scope of Environmental Concerns

Chair(s): Laharish Guntuka

093-1001 Supply Chain Integration and Environmental Performance

Samuel Famiyeh, Associate Professor, GIMPA, Ghana
Disraeli Asante - Darko, Lecturer, GIMPA, Ghana
kwasi amoko-gyampah, Professor, North Carolina State University, United States
Ebenezer Adaku, Senior Lecturer, GIMPA, Ghana

When organizations build long term relationships with suppliers and buyers, they are likely to better understand their needs, which in turn improves performance. The objective of this paper is to investigate as to whether such relationships are able to drive the environmental performance of the focal firm using data.

093-1981 When Are Retailer's Instruments to Induce Higher Supplier Social Responsibility Level Effective?

Haiying Yang, Student, Syracuse University, United States
Zhengping Wu, Associate Professor, Syracuse University, United States

Different instruments (e.g., cost subsidy) have been used in practice by retailers to induce improved social responsibility level of their upstream. We examine parametric conditions under which such measures are effective.

093-0252 A Localized Climate Change Model of The Global Supply Chain

Laharish Guntuka, Student, University of Maryland, United States
Sandor Boyson, Professor, University of Maryland, United States
Michael Maddox, Post Doc/Researcher, University of Maryland, United States
Michael Gerst, Assistant Professor, University of Maryland, United States
Melissa Kenney, Associate Professor, University of Maryland, United States

We develop a localized climate change model by linking the most granular climate data available with the most precise geocoded manufacturing locations in a firm's supply chain network to determine the timing and severity of threats. The model can assist supply chain executives to make earlier, more responsive strategic investments.

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

Invited Session: Choice Modeling in Online Platforms

Chair(s): Vahideh Manshadi, Negin Golrezaei

093-0353 Assortment Optimization with Click Behavior

Jacob Feldman, Assistant Professor, Washington University St Louis, United States

We consider a modified version of the classical assortment optimization problem relevant to e-commerce settings in which the consideration set of each arriving customer is determined by the products they click. Customers then choose among the products in their consideration set according to an MNL choice model.

093-1118 Performance Guarantees for Revenue Maximization in Online Type Matching

Elaheh Fata, Student, Massachusetts Institute of Technology, United States
Will Ma, Post Doc/Researcher, Google Research, United States
David Simchi-Levi, Professor, Massachusetts Institute of Technology, United States

Dynamic matching is challenging due to the uncertainty in the future agents' arrival. We consider this problem from a central platform's perspective who has established the types of agents that may arrive and relationships between them. The goal is to maximize the total reward earned by matching agents over time.

093-1609 Assortment Optimization for Online Marketplaces

Santiago Balseiro, Assistant Professor, Columbia University, United States
Antoine Desir, Assistant Professor, INSEAD, France

We consider the assortment optimization problem faced by a platform connecting consumers and sellers with private information about the products they sell. We design tractable mechanisms for the platform that truthfully elicit the sellers' private information while taking into account the externalities among displayed sellers in the assortment.

093-2144 Two-Stage Pandora's Box for Product Ranking

Negin Golrezaei, Professor, MIT Sloan School of Management, United States
Vahideh Manshadi, Assistant Professor, Yale University, United States
Vahab Mirrokni, Research Director , Google, United States

We study how platforms with different business models should rank products to maximize their profit. We develop a two-stage sequential search model and propose optimal or fully polynomial-time approximation scheme ranking algorithms under two diametric business models.

395

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

Invited Session: Statistical and Machine Learning Methods in POM

Chair(s): Zeyu Zheng

093-0792 Dynamic Assortment Planning with Changing Contextual Information

Xi Chen, Assistant Professor, New York University, United States
Yining Wang, Student, Carnegie Mellon University, United States
Yuan Zhou, Assistant Professor, Indiana University at Bloomington, United States

We consider the problem of dynamic assortment planning with changing feature information and the customers' preferences is modeled by items' feature vectors together with an unknown linear model. We present a dynamic policy for simultaneous learning preference models and maximizing expected revenues, and give the near-optimal regret analysis.

093-0277 Dynamic Learning of Sequential Choice Bandit Problem Under Marketing Fatigue

Junyu Cao, Student, University of California Berkeley, United States
Wei Sun, Research Staff Member, IBM Research, United States
Zuo-Jun Max Shen, Professor, University of California Berkeley, United States

We consider a setting where a platform offers a sequence of messages to its users and is penalized when users abandon the platform due to marketing fatigue. A novel sequential choice model is used to capture multiple interactions. We further propose an online-learning algorithm and characterize its regret bound.

093-2026 Statistical Inference for Model Parameters in Polyak-Ruppert Averaging

Jing Dong, Assistant Professor, Columbia University, United States

Polyak-Ruppert Averaging has been a widely used statistical estimation involving large data set. We develop a general framework using batch means with a fixed number of batches to construct confidence regions for true model parameters in Polyak-Ruppert Averaging. Our results provide insights into the choice of the batch size.

093-1992 Quantile Markov Decision Processes

Xiaocheng Li, Student, Department of Management Science and Engineering, Stanford University, United States
Huaiyang Zhong, Student, Department of Management Science and Engineering, Stanford University, United States
Margaret Brandeau, Professor, Stanford University, United States

We consider the problem of optimizing the quantiles of the cumulative rewards of Markov Decision Processes (MDP), to which we refers as Quantile Markov Decision Processes (QMDP). Our framework of QMDP provides analytical results characterizing the optimal QMDP solution and presents the algorithm for solving the QMDP.

396

Sunday, 09:45 AM - 11:15 AM, Coats — Track: Manufacturing Operations

Contributed Session: Capacity and Workforce Management

Chair(s): Patricia Heuser

093-0720 "Training Methods That Accelerate Productive Quality Work from "New-to-the-Job" Employees"

Marc Schwartz, Associate Director, Tyson Foods, United States

Employees in new work environments are more conducive to slowed production and customer quality spills. On-the-job training increases cost and time to develop competent work experience. This presentation introduces a framework based on visual management and personal coaching that facilitates learning critical job skills faster than traditional learning models

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093-0044 Service Level Based Decision-Making for Capacity Dimensioning

Joakim Wikner, Professor, Jonkoping University, Sweden
Stig-Arne Mattsson, Professor, Jonkoping University, Sweden

Capacity dimensioning is a core challenge for OM. The formal support for these decisions are scarce in literature and practice, but analogies between inventory management and capacity management provide opportunities for cross-fertilization. The perishable character of capacity poses additional challenges handled here by quantitative dimensioning of a capacity addition.

093-1631 Integrating Innovation Capability into the Competitive Progression Theory

Inga Stankevice, Associate Professor, Kaunas University of Technology, Lithuania
Mantas Vilkas, Associate Professor, Kaunas University of Technology, Lithuania
Rimantas Rauleckas, Associate Professor, Kaunas University of Technology, Lithuania

The research aims to elaborate Competitive Progression Theory by including innovation capability. CB- SEM method was used on a representative sample of manufacturing firms of ES country (N=500). The results reveal the position of innovation capability in the sequence of capabilities development and factors as well as moderators.

093-1706 Consequences of Budgeted Training Measures and Demand Volatility in Production Systems and Workforce Planning

Patricia Heuser, Student, Chair of Management Accounting, Germany
Peter Letmathe, Professor, Rwth Aachen University, Germany
Matthias Schinner, Student, Rwth Aachen University, Germany

Fast changing markets and new technologies force companies to adjust employees' skill portfolios through training. We compare different concepts of employee training by budgeting training measures in two dimensions: training capacity per period and periods without training. Further, we investigate different training strategies under demand volatility and different capacity scenarios.

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

Invited Session: Scheduling with Quotation, Cross-Docking, Rescheduling, and Gaming

Chair(s): Zhixin Liu

093-0391 Horizontal and Vertical Collaborations in Cross-Docking Supply Networks

Seulchan Lee, Student, Mays Business School, 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

Cross-docking systems enable consolidations of many small load shipments. In some cross-docking networks, companies collaborate with their supply chain partners operating at successive stages or with partners operating at the same stage within the distribution channels. We study implications of vertical and horizontal collaborations in a cross-docking distribution network.

093-0749 A Coordination Mechanism for Decentralized Scheduling on Parallel Batch Machines with Setup Cost

Guoqiang Fan, Student, Northwestern Polytechnical University, China
Junqiang Wang, Professor, Northwestern Polytechnical University, China
Zhixin Liu, Associate Professor, University of Michigan Dearborn, United States
Quanneng Wang, Student, Northwestern Polytechnical University, China

We consider a scheduling game on parallel batch machines. Each batch has a constant setup cost. The job's cost is the sum of its completion time and the shared setup cost. The social cost is the maximum job cost. We propose a coordination mechanism and analyze its price of anarchy.

093-1797 Resilient Nurse Scheduling and Rescheduling Optimization Under the Uncertainty of Workload Demand

Jian Hu, Associate Professor, University of Michigan Dearborn, United States

Major challenges in nurse scheduling problems are unforeseen patient demand, absenteeism, and willingness for overtime. The research idea is to develop a stochastic dynamic optimization model, where the here-and-now decision makes an initial schedule, and the wait-and-see decision in the operation stage finds the optimal on-call adjustment policy.

093-1283 Scheduling with Order Quotation and Due Date Related Cost

Zhixin Liu, Associate Professor, University of Michigan Dearborn, United States

We study a joint price quotation and scheduling problem. Each order quote can either be accepted or rejected by a customer and has a due date related cost when processed. We develop algorithms to calculate expected scheduling costs under given price quotes and design algorithms to find efficient quotes.

Sunday, 09:45 AM - 11:15 AM

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

Invited Session: Panel: Operational Excellence around the World

Chair(s): Rachna Shah Torbjørn Netland

093-2398 Operational Excellence Around the World

Torbjørn Netland, Assistant Professor, Eth Zurich, Switzerland
Jiju Antony, Professor, Heriot-Watt University, United Kingdom
Guilherme Tortorella, Assistant Professor, Universidade Federal De Santa Catarina, Brazil
Gopalakrishnan Narayanamurthy, Lecturer, University of Liverpool, United Kingdom
Dino Petrarolo, Senior Vice President, Competitive Capabilities Int, South Africa
Rachna Shah, Associate Professor, University of Minnesota, United States

This panel takes the pulse on operational excellence research and practice around the world.

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Sunday, 09:45 AM - 11:15 AM, Columbia 3 Track: Healthcare Operations Management

Contributed Session: Appointment scheduling

Chair(s): YANG YANG

093-2393 Data-Driven Appointment Scheduling Under a Class of Convex Delay Risk Measures

Shuming Wang, Associate Professor, University of Chinese Academy of Sciences, China
Zhan Pang, Associate Professor, Purdue University, United States

We consider an appointment sequencing and scheduling problem with limited service time data available where the server's overtime and the users' waiting times have some tolerance levels. We propose a convex delay risk measure and solve the problem in a distributionally robust optimization framework.

093-0217 Managing Appointment Scheduling with Walk-ins Under Two Agent Perspectives

Shenghai Zhou, Student, Shanghai Jiao Tong University, China
Guohua Wan, Professor, Shanghai Jiao Tong University, China

Consider an appointment scheduling problem with walk-ins and no-shows, we develop a two-agent optimization framework to distinguish the two types of patients with two diffent performance regimes. We first prove some structural properties of the optimal schedule and then develop an SAA-based methed to reformulate the problem as MILP.

093-1421 Analysis of Appointment Systems with Strategic Walk-Ins

Feray Tuncalp, Student, Koc University, Turkey
Lerzan Ormeci, Associate Professor, Koc University, Turkey
Evrim Gunes, Associate Professor, Koc University, Turkey

We consider an outpatient clinic which allocates some slots to walk-in patients. We analyze equilibrium behavior of patients who can choose between waiting for the given appointment or applying to the clinic as a walk-in, given different costs of each option. We compare the socially optimal and equilibrium behaviours.

093-2305 Design of an Appointment System for an Infertility Clinic

YANG YANG, Student, City University of Hong Kong, Hong Kong
Frank Chen, Professor, City University of Hong Kong, Hong Kong
Zhankun Sun, Assistant Professor, City University of Hong Kong, Hong Kong

In a congested infertility clinic, it is difficult to utilize the cancelled slots due to fairness concern. We propose a flexible appointment policy to address this issue. Our simulation results show that the policy significantly reduces patient waiting times and improves the utilization of appointment slots.

400

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

Invited Session: Prediction in queues: applications to healthcare

Chair(s): Fernanda Bravo

093-0429 Simple Rules for Predicting Congestion in Queueing Systems with Application to Intensive Care Units

Fernanda Bravo, Assistant Professor, UCLA Anderson School of Management, United States
Cynthia Rudin, Associate Professor, Duke University Durham, United States
Yaron Shaposhnik, Assistant Professor, Simon Business School, United States
Yuting Yuan, Student, University of Rochester, United States

We study the problem of predicting congestion in service systems. We demonstrate through extensive computational study that machine learning algorithms can be effectively used to devise simple rules to predict "high-risk" states which are likely to lead to a congested state in the near future.

093-2089 Responsible Machine Learning Systems in Healthcare Decision Making Systems

Muhammad Ahmad, Assistant Professor, University of Washington, United States

Predictive machine learning models are not sufficient for wide adoptability in healthcare. Responsible Machine learning systems which are explainable, transparent, understandable, fair and compliant are needed for wide adaptability. In this session we will elucidate the nuances around responsible ML and its limitations.

093-1690 Predictive Analytics for Inpatient Readmissions

Hui Jia, Student, University of Tennessee Knoxville, United States

Haileab Hilafu, Assistant Professor, University of Tennessee, United States
Bogdan Bichescu, Associate Professor, University of Tennessee Knoxville, United States

Recent Medicare initiatives linking reimbursements to readmission rates have placed renewed pressure on hospitals to reduce patient readmissions. We utilize a novel predictive analytics technique to predict inpatient readmissions. Preliminary results indicate that our approach yields competitive (often superior) performances compared to existing methods, including logistic regression and neural networks.

401

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

Invited Session: Healthcare Operations 2.0: Behavioral, Incentive and Policy Issues

Chair(s): Tinglong Dai

093-0219 Conspicuous by its Absence: Diagnostic Expert Testing Under Uncertainty

Tinglong Dai, Associate Professor, Johns Hopkins University, United States
Shubhranshu Singh, Assistant Professor, Johns Hopkins University, United States

We study a medical expert's decision to offer a diagnosis to a patient. The expert's diagnostic ability is her private information. We show that a high-ability expert may skip necessary diagnostic tests to separate her from the low-ability expert. Interestingly, under-testing arises only when the reputational payoff is intermediate.

093-1885 Risk-Sharing vs Traditional Pharmaceutical Contracts

Andrew ElHabr, Student, Georgia Institute of Technology, United States
Can Zhang, Assistant Professor, Duke University Durham, United States
Turgay Ayer, Associate Professor, Georgia Tech, United States

We study under what market conditions and drug characteristics payers and pharmaceutical manufacturers are better off engaging in a risk-sharing contract, an agreement that links payments for drugs to drug effectiveness, over a traditional contract. Our findings include that moderately cheap and effective drugs can be good candidates for risk-sharing.

093-0676 Treating to the Priority in Heart Transplantation

Sait Tunc, Post Doc/Researcher, University of Chicago, United States
Burhaneddin Sandikci, Associate Professor, University of Chicago, United States
Philipp Afeche, Associate Professor, University of Toronto, Canada
William Parker, Post Doc/Researcher, University of Chicago, United States

US heart allocation system assigns priorities to waiting candidates based on the therapies they receive, however, therapy-based prioritization opens up room for gaming the system. We analytically study the gaming decisions of centers, understand when strategic gaming emerges under different competition types, and how it can be prevented.

093-2447 Too Much? Too Little? Economic Modeling of Physician Testing Decisions

Tinglong Dai, Associate Professor, Johns Hopkins University, United States

By some estimates, up to 30% of medical-testing decisions are deemed inappropriate, which may entail either over- or under-testing. Both phenomena are prevalent, but under-testing has garnered little media coverage. In this talk, I discuss several recent modeling efforts aimed at understanding physician decision-making leading to over- and under-testing.

402

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

Contributed Session: Health systems and organizations

Chair(s): Gawon Yun

093-1689 Embeddedness and Hierarchy: A Network Analysis in the Healthcare Industry

Daniel Lopes, Student, Fundacao Getulio Vargas, Brazil
Susana Pereira, Associate Professor, Fundacao Getulio Vargas, Brazil

We expand the role of embeddedness by investigating a situation in which embeddedness can increase transaction costs and favor hierarchy. We test our argument through a network analysis of 1,083 contracts between physicians and hospitals. We found that access to non-redundant information, a consequence of embeddedness, may influence hierarchical structures.

093-0414 Designing Service Processes for Effective Customer Participation: Modular Service Approach

Syed Aamir Ali Shah, Post Doc/Researcher, Lahore University of Management Sciences, Pakistan
Muhammad Shakeel Sadiq Jajja, Assistant Professor, Lahore University of Management Sciences, Pakistan

This research seeks to develop and empirically test a design-based framework for effective patient participation (EPP) in service delivery in Pakistan. Using customer learning research, we contend that infra-structural (customer education) and structural level (service modularity) design choices of the firm may enhance EPP for better operational outcomes.

093-0138 Application of Social Choice Theory to Modify the Value Measure of Health Systems

Yelin Fu, Post Doc/Researcher, University of Hong Kong, Hong Kong
K.K. Lai, Professor, Shenzhen University, China
George Q. Huang, Professor, The University of Hong Kong, Hong Kong

The Value Measure is the arithmetic average of the scores from three sub-metrics: access, satisfaction, and efficiency. A significant drawback of the Value Measure is the possibility of compensation. For this reason, this paper proposes a new methodology in a social choice theory framework.

093-2039 Manufacturing Reshoring in Medical Devices and Pharmaceuticals

Gawon Yun, Student, University of Rhode Island, United States

Douglas Hales, Professor, University of Rhode Island, United States

This study develops a conceptual reshoring model by examining factors for manufacturing reshoring decisions in the healthcare industry, dominated by strict quality requirements, regulations, high R&D involvement, and complex validation process. It finds that firms in healthcare manufacturing may locate based on product complexity and specialization in customer-driven products.

403

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

Contributed Session: Important Issues in Modern Supply Chain Management

Chair(s): Nallan Suresh

093-0003 Addressing Supply Chain Efficiency: Managing Critical Success Factors through a 7V Themed Framework

Scott Bambrick, Senior Lecturer, Manchester Metropolitan University, United Kingdom

Studies suggests efficiency sought by organisations within their supply chains is not being attained. We focus upon the development and testing of a 7V Themed conceptual framework, which through quantitative research now encapsulates Critical Success Factors and can lead to the efficient delivery within supply chains.

093-0831 Supply Chain Partnership as a Strategic Choice for Global Companies

Lumbidi Kupanhy, Professor, Wakayama University, Japan

This paper focuses on the conceptual shift from supply chain integration (SCI) to supply chain partnership (SCP) based on strategic collaboration and cooperation. SCP seems to reflect and match the successful patterns of global players of today's globalized business environment featuring fast advances of ever-changing information and communications technology (ICT).

093-0887 Network Governance and Relational Embeddedness in Triadic Supply Chains: Implications for the Network Rent

Artur Swierczek, Associate Professor, University of Economics in Katowice, Poland

The study seeks to investigate whether and how relational embeddedness is dependent upon the network governance in triadic supply chains, and further on, if relational embeddedness mediates the relationship between the network governance and the network rent. In order to address this goal, the study uses empirical research.

093-1906 Disentangling Lean and Agility: A Configuration and Contingency Analysis of Supply Chain Performance

Nallan Suresh, Professor, Suny At Buffalo, United States
Michael Braunscheidel, Associate Professor, State University of New York, Brockport, United States

This survey-based empirical study disentangles lean and agility initiatives by studying differential impacts of elemental practices on supply chain and business performance. It uses an ideal-profile methodology to isolate lean and agility practices relating to high-performance firms and demonstrates that the gap from efficiency frontier adversely affects relative performance.

404

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

Contributed Session: Inventory Problems in Production and Distribution Systems

Chair(s): C. Daniel Guetta

093-1838 Determining Optimal Levels in VMI with Buyer Constraints

Rajesh Srivastava, Professor, Florida Gulf Coast University, United States
Elias Kirche, Associate Professor, Florida Gulf Coast University, United States

We determine the optimal maximum and minimum levels for a vendor managed inventory system considering capacity constraints, lead time, service levels and demand patterns in a buyer dominated environment. The performance is compared with a traditional order quantity model and issues arising from lost orders are discussed.

093-1908 A Lagrangean Relaxation Algorithm for Capacitated Lot Sizing Problem Under Co-Production

Banu Kabakulak, Post Doc/Researcher, Bogazici University, Turkey
Semra Agrali, Professor, MEF University, Turkey
Caner Taskin, Professor, Bogazici University, Turkey

In co-production systems while a product is being produced, one or more products are produced at the same time. We formulate a capacitated lot-sizing problem for such co-production systems and develop a Lagrangean relaxation algorithm for the solution. We test our method on a number of randomly generated instances.

093-2385 Distributionally Robust Newsvendor with Causal Demand

Meng Qi, Student, University of California Berkeley, United States
Ying Cao, Student, University of California Berkeley, United States
Zuo-Jun Max Shen, Professor, University of California Berkeley, United States

We investigate the newsvendor problem under the assumption that there's a linear dependency between demand and explanatory features. In this work, a distributionally robust approach is proposed with the ambiguity set constructed using Wasserstein distance. Under mild assumptions, we provide a tractable reformulation and prove its performance guarantees.

093-1113 Two Echelon Distribution Systems with Random Demands and Storage Constraints

Awi Federgruen, Professor, Columbia University, United States
C. Daniel Guetta, Lecturer, Columbia University, United States
Garud Iyengar, Professor, Columbia University, United States

We consider a two-echelon distribution system comprising a depot and multiple capacity-constrained outlets facing random demands for multiple items. We propose a heuristic for this class of model together with a new approach to generating lower bounds. We report on an extensive numerical study for a range of model parameters.

405

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

Invited Session: Social Preferences and Sharing Economy

Chair(s): Shan Li Diana Wu

093-0509 On Mechanisms with a Fairness-Concerned Supplier: Theory and Experimentation

Wanshan Zhu, Associate Professor, Tsinghua University, China
Zewu Jiang, Student, Tsinghua University, China
Yang Zhang, Assistant Professor, Tsinghua University, China
Xiaobo Zhao, Professor, Tsinghua University, China
Jinxing Xie, Professor, Tsinghua University, China

Behavioral factors such as fairness affect the decisions and performance of partners in a supply chain; they need to be accounted for in mechanism design. We study the optimal nonlinear and linear mechanisms for the retailer and find both mechanisms have their merits under different conditions due to certain behaviors.

093-0521 Social Preferences in Network Games: Theory and Laboratory Evidence

Yang Zhang, Assistant Professor, Tsinghua University, China

This paper investigates social preferences in network games, where the network structure determines whose action affects the payoff of which player. We develop alternative theories that incorporate inequality aversion and welfare preference into the context of network games and test their implications in a laboratory experiment.

093-2189 Information, Subsidies or Surge? An Experimental Approach to Drivers Relocation

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

Relocating drivers to different geographical regions to reduce the mismatch between the demand and supply is important for on-demand ride hailing platform. We consider a variety of policies to incentivize drivers for relocation. We examine the effectiveness of those policies to relocate drivers in a series of controlled experiments

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093-0966 The Commitment Conundrum of Inventory Sharing

Shan Li, Assistant Professor, Baruch College, United States
Kay Yut Chen, Professor, University of Texas Arlington, United States

In this paper, we take a behavioral lens to study the impact of different transfer price contracting schemes and inventory sharing schemes on local decision making of decentralized retailers, constructing a behavioral model, incorporating bounded rationality, fairness, and psychological pain of excess supply to explain the findings.

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

Invited Session: Product development, technology management, and process innovation in healthcare

Chair(s): Zhili Tian

093-1527 Managing Public-Private Partnerships for the Development of Drugs for Neglected Diseases

Rongrong Luo, Student, Singapore University of Technology and Design, Singapore
Niyazi Taneri, Assistant Professor, National University of Singapore, Singapore
Ying Xu, Assistant Professor, Singapore University of Technology and Design, Singapore
Shantanu Bhattacharya, Associate Professor, Singapore Management University, Singapore

Although neglected diseases seriously impair people' lives, biopharmaceutical firms lack financial incentives to develop drugs for them. The prevalent solution is to build R&D collaboration between an NGO and the firms. We analyze such a contractual relationship and see how the NGO balances different incentives within restricted funding.

093-0130 Determinants of Process Innovation in Pharmaceutical Industry

Ivan Lugovoi, Student, Hec Paris, France
Dimitrios Andritsos, Assistant Professor, Hec Paris, France
Claire Senot, Assistant Professor, Tulane University, United States

We address the following research questions: (1) How do firms' technological capabilities (e.g., in-house manufacturing, technological diversity, product portfolio etc.) impact their ability to develop process innovations and (2) How do market characteristics such as market size and degree of competition moderate these effects?

093-0613 Optimal Investment in New Drug Development Under Uncertainties

Zhili Tian, Assistant Professor, Coastal Carolina University, United States

Drug development is expensive and requires enrolling and treating hundreds or thousands of patients at hundreds of test centers. We model the problem as a discrete time, discounted, dynamic program with the objective of maximizing the expected net present value of a drug based on the costs of conducting the trial.

407

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

Invited Session: Tutorial: Data-driven inventory and pricing optimization

Chair(s): Xiuli Chao

093-2399 Tutorial: Data Driven Inventory and Pricing Optimization

Xiuli Chao, Professor, University of Michigan - Ann Arbor, United States
Boxiao (Beryl) Chen, Assistant Professor, School of Business, United States

Inventory control and pricing optimization are among the most important decisions for a company, especially in today's fast changing environment and dynamic world economy. In this tutorial, I will review some recent research work in this area, with an emphasis on adaptive demand learning.

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

Invited Session: Interface between Services and Supply Chain Management

Chair(s): Yan Dong Wenjin Hu

093-0293 Disruption Impact and Recovery: The Role of Supply-Chain Complexity

Robert Wiedmer, Assistant Professor, Arizona State University Tempe, United States
Zac Rogers, Assistant Professor, Colorado State University Fort Collins, United States
Mikaella Polyviou, Assistant Professor, Arizona State University, United States
Carlos Mena, Professor, Portland State University, United States
Sangho Chae, Assistant Professor, Tilburg University, Netherlands

Using shipment records of automotive products from Japan and Germany to the U.S., we examine the role of supply chain complexity in moderating the impact of and recovery from the 2011 Tohoku Earthquake and Tsunami in Japan. Results suggest that product, sourcing, and logistics complexity moderates disruption, impact, and recovery.

093-0612 The Adoption of 3D Print in Spare Parts Supply Chain

Yang Cheng, Associate Professor, Aalborg University, Denmark

Based on multi-methods, this paper explores the adoption of 3D print in spare parts supply chain, where customer service is related to reliably and consistently keep customers' equipment in operational condition. Specifically, this paper discusses how to select proper spare parts and how to set up supply chain configuration.

093-0178 Information on Pre-Sales Demand or Transferring Unsold Products: Transshipment for Asynchronous Sales

Hisashi Kurata, Associate Professor, University of Tsukuba, Japan

The sales of seasonal products in different locations often start at different times. Assuming two retailers belonging to one chain, between which lateral transshipment exists, we analyze how the later-seller can utilize transferred, unsold products, and information of demand from the earlier-seller to improve its inventory efficiency.

093-0285 Effect of Suppliers' Mergers on Buyer's Cost Performance

Wenjin Hu, Student, Zhejiang University, China
Yan Dong, Associate Professor, University of South Carolina, United States
Keith Skowronski, Assistant Professor, University of South Carolina, United States
Yongyi Shou, Professor, Zhejiang University, China

This paper aims at studying the effect of suppliers' mergers on focal firm's cost performance in the supply chain context. The empirical results of this paper show that suppliers' mergers can influence focal firm's performance. This paper also finds that the effect varies across supply base characteristics.

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Sunday, 09:45 AM - 11:15 AM, Monroe Track: Purchasing and Supplier Management

Invited Session: Tutorial: Publishing conceptual and empirical research in purchasing and supply management

Chair(s): Wendy Tate Stephan Wagner

093-2413 Publishing Conceptual and Empirical Research in Purchasing and Supply Management

Wendy Tate, Professor, University of Tennessee, United States
Stephan Wagner, Professor, Swiss Federal Institute of Technology Zurich, Switzerland

In this tutorial, Editors of the Journal of Purchasing & Supply Management will discuss and share their experience with conceptual and empirical research in purchasing and supply management, and how such research should be conducted and prepared in order to be considered for journal publication

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Sunday, 09:45 AM - 11:15 AM, Lincoln East Track: Humanitarian Operations and Crisis Management

Contributed Session: Humanitarian Supply Chains & Healthcare

Chair(s): Marianne Jahre

093-0602 Sustainable Humanitarian Supply Chain Management: Developing a Framework Using DEMATEL Approach

Abhishek Behl, Post Doc/Researcher, Indian Institute of Technology Bombay, India
Pravin Suryawanshi, Student, Indian Institute of Technology Bombay, India
Pankaj Dutta, Assistant Professor, Indian Institute of Technology Bombay, India

The present study address concepts of sustainability with HSC management in the light of natural disasters in Indian context. The study aims to explore barriers of sustainable HSCM practices by analyzing their hierarchy using DEMATEL based approach. The study also proposes the application of this framework in achieving financial resilience.

093-1947 Humanitarian Operations: Take a Walk on the Dark Side

Renata Anderson, Lecturer, Northern Kentucky University Highland Heights, United States
Armindo Teodosio, Professor, Pontificia Universidade Catolica de Minas Gerais, Brazil

Mariana Caeiro, Student, Pontificia Universidade Catolica de Minas Gerais, Brazil

Humanitarian workers are typically portrayed in a positive light. We explore the darker side of the humanitarians by considering how abuse of power, sexual violence, and harassment happen during the projects. A qualitative study with humanitarian workers shows that the most effective weapon against sexual violence and harassment is prevention.

093-1010 Vaccine Distribution Supply Chains in Developing Countries: A Literature Review

Kim De Boeck, Student, Katholieke Universiteit Leuven, Belgium
Catherine Decouttere, Student, KU Leuven, Belgium
Nico Vandaele, Professor, KU Leuven, Belgium

Access to immunization varies greatly across the world. To increase vaccine coverage, the required vaccines need to be able to reach the targeted population. However, in developing countries, this often turns out to be a challenge. Our article provides a literature review on vaccine distribution supply chains in developing countries.

093-1574 Medicine and Vaccine Shortages – Risks in Developing and Industrialized Countries

Marianne Jahre, Professor, BI Norwegian Business School, Norway
Kim Van Oorschot, Associate Professor, BI Norwegian Business School, Norway
Kostas Selviaridis, Senior Lecturer, Lancaster University, United Kingdom
Harwin De Vries, Lecturer, INSEAD, France
Luk Van Wassenhove, Professor, INSEAD, France

The paper presents initial results from studies on shortages in medical supply chains, and their causes, i.e. normal and abnormal risks, in the supply chains and their contexts. An increasing problem globally, but with different causes between developing and industrialized countries, interventions are required to bridge demand and supply.

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

Invited Session: Empirical Research Using Supply Networks

Chair(s): William Schmidt

093-0146 In Supply Chains We Trust

Volodymyr Babich, Associate Professor, Georgetown University, United States
Gilles Hilary, Professor, Georgetown University, United States
Zi'ang Wang, Student, City University of Hong Kong, Hong Kong
Jing Wu, Assistant Professor, City University of Hong Kong, Hong Kong

Trust stands at the core of social capital. Using social capital survey and firm-level supply chain data, we find that equilibrium firms form supply chain relationships when their trust environments are similar. When facing exogenous or endogenous disruptions, supply chain relationships involving a high trust firm are more stable.

093-0524 Evolution of Supply Networks

Nikolay Osadchiy, Associate Professor, Emory University, United States
Vishal Gaur, Professor, Cornell University, United States
Maximiliano Udenio, Assistant Professor, KU Leuven, Belgium

Using a large panel of firm-level buyer-supplier relationships, we study the evolution and fragmentation of supply networks over time and implications for individual supply chains.

093-1473 Institutional Effects on Logistics Outsourcing Decision

Soomin Park, Assistant Professor, The Citadel, United States
Serhiy Ponomarov, Assistant Professor, The Citadel, United States

As supply chains get complex and globalized, firms rely more on logistics service providers, and world leading companies even require their suppliers to use services provided by the providers. Since those services seem to provide legitimacy, this study, based on institutional theory, investigates how institutional pressures affect logistics outsourcing decision.

093-0135 The Bullwhip Effect in Supply Networks

Nikolay Osadchiy, Associate Professor, Emory University, United States
William Schmidt, Assistant Professor, Cornell University, United States
Jing Wu, Assistant Professor, City University of Hong Kong, Hong Kong

We offer a new network perspective on one of the central topics in Operations Management – demand variability and the bullwhip effect. Using data on supply chain linkages, we provide empirical evidence that buyer-supplier relationship formation or dissolution is used to smooth the aggregate demand experienced by suppliers.

412

Sunday, 09:45 AM - 11:15 AM, Jefferson East Track: Retail Operations

Invited Session: Structural Models in Retail Operations Management

Chair(s): Stanley Lim

093-0477 Optimizing Assortment Size in Online Platforms

Abhinav Sinha, Post Doc/Researcher, Columbia University, United States
Yash Kanoria, Assistant Professor, Columbia University, United States
Fanyin Zheng, Assistant Professor, Columbia University, United States
Zhenyu Lai, Director, Wayfair, United States

Using data from Wayfair, a large online home goods e-retailer, we estimate a discrete choice model that incorporates the choice paralysis faced by consumers when there are too many differentiated products. Using our estimated model, we infer the optimal assortment size and variety on the platform.

093-0650 Menu Costs and the Bullwhip Effect: Supply Chain Implications of Dynamic Pricing

Robert Bray, Associate Professor, Northwestern University, United States
Yannis Stamatopoulos, Assistant Professor, University of Texas Austin, United States

We estimate whether reducing menu costs (the operational costs of price adjustment) would increase or decrease the bullwhip effect.

093-1541 Local Food and the Sharing Economy

Lina Wang, Student, Arizona State University, United States
Elliot Rabinovich, Professor, Arizona State University Tempe, United States
Timothy Richards, Professor, Arizona State University Tempe, United States

This study empirically examines indirect network effects in the context of a two-sided online food platform involving local food vendors. Results obtained from a consumer demand model and a supply-provision equilibrium model confirm the existence of positive indirect network effects induced by an increase in the number of local vendors.

093-0157 Scan-Based Trading and Bargaining Power: A Structural Model of Vertical Retail Supply Relationships

Stanley Lim, Student, Arizona State University, United States
Timothy Richards, Professor, Arizona State University Tempe, United States
Elliot Rabinovich, Professor, Arizona State University Tempe, United States
Min Choi, Assistant Professor, California State University Fullerton, United States

Using a Nash-in-Nash bargaining model, panel data, and structural econometrics, we examine the relationship between scan-based trading (SBT), contracting, and degree of bargaining power exercised by retailers/wholesalers in a vertical retail channel. We find both retailer bargaining power and inventory shrink are higher under SBT than direct-to-store delivery contracts.

413

Sunday, 09:45 AM - 11:15 AM, Jefferson West — Track: Sustainable Operations

Contributed Session: Sustainable Innovation

Chair(s): Kang Hsu

093-1214 Antecedents of Sustainability-Oriented Innovation in Manufacturing Organizations

Budi Harsanto, Student, University of Liverpool, United Kingdom
Niraj Kumar, Associate Professor, University of Liverpool, United Kingdom
Yuanzhu Zhan, Student, ????, United Kingdom
Roula Michaelides, Reader, Manchester Metropolitan University, United Kingdom

This study aims to understand the antecedents of sustainability-oriented innovation (SOI) and examine the factors affecting the development of SOI capability in manufacturing organizations. A case study based approach is adopted to understand the process of SOI capability development in Indonesian manufacturing organizations.

093-1997 Sustainable Innovation Practices and the Degree of Innovation of Business Models in Brazilian Industrial Companies

Jordana Kneipp, Professor, Santa Maria Federal University, Brazil
Clandia Gomes, Associate Professor, Santa Maria Federal University, Brazil
Francies Motke, Student, Santa Maria Federal University, Brazil
Kamila Frizzo, Student, Santa Maria Federal University, Brazil
Isak Kruglianskas, Professor, Universidade De Sao Paulo, Brazil

This study has aimed to analyze the relationship between the adoption of sustainable innovation practices and the degree of innovation of business models in Brazilian industrial companies. Results have shown that companies with a high degree of innovation in their business models invest more strongly in sustainable innovations.

093-2243 Product Innovation Under Regulatory Conditions

Mohammad Saoud, Assistant Professor, Kuwait University, Kuwait

We study the effect of regulations on the attribute level of regulated appliances. We use stochastic dynamic programming to model a multi-period problem and characterize optimal solution decisions. Main decisions are the tooling level and the products to be offered during any period of time given a finite time horizon

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093-2289 The Effect of Climate Change Risks on Green Innovation

Kang Hsu, Student, Arizona State University, United States
Kevin Dooley, Professor, Arizona State University Tempe, United States

Firms are facing ever evolving risks (changing policies and regulations, changes in technology, and physical risks such as extreme weather events) due to climate change. Firms can combat these risks by investing in green innovation: both in product development and processes.

414

Sunday, 09:45 AM - 11:15 AM, Georgetown East — Track: Supply Chain Risk Management

Invited Session: Topics in Humanitarian Operations

Chair(s): Fang Liu J. Lemuel Martin

093-0360 A 2-Stage Stochastic Model to Allocate Water in Post-Disaster Environments

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

Sofia Perez-Guzman, Student, Rensselaer Polytechnic Institute, United States
Jose Holguin-Veras, Professor, Rensselaer Polytechnic Institute, United States
John Mitchell, Professor, Rensselaer Polytechnic Institute, United States

This study develops a 2-stage stochastic MIP for the allocation of water under uncertainty for the time the population expects to return to normal. The model minimizes the expected social cost that includes the cost of human suffering in distribution of aid during post-disaster response measured by its willingness-to-pay.

093-0508 Volunteer Management in Charity Storehouses: Volunteer Experience, Congestion, and Operational Performance

Gloria Urrea, Post Doc/Researcher, Indiana University, United States
Alfonso Pedraza-Martinez, Associate Professor, Indiana University, United States
Maria Besiou, Professor, Kuehne Logistics University, Germany

We study volunteer management at a charity storehouse. Volunteers work in teams to prepare orders (food and hygiene items) for beneficiaries. On-time order fulfillment (performance) depends on volunteers' heterogeneous experience and storehouse congestion (due to volunteers' random arrival times). Using simulation, we identify policies to improve performance under disaster conditions.

093-1724 Scheduling Staff for FEMA's National Response Coordination Center

Kai Friesecke, Student, George Washington University, United States
Erica Gralla, Assistant Professor, George Washington University, United States
Hernan Abeledo, Associate Professor, George Washington University, United States
Joseph Barbera, Associate Professor, George Washington University, United States

The Federal Emergency Management Agency's National Response Coordination Center coordinates federal support for response to major disasters. We describe a scheduling approach that efficiently rosters qualified personnel and minimizes violation of staff preferences. Results show which preferences are hard to satisfy and provide recommended roster sizes and cross-training requirements.

093-1326 Characterizing Material Convergence: Inventory Management Under Limited Storage and Depletion

J. Lemuel Martin, Student, Nanyang Technological University, Singapore
Fang Liu, Assistant Professor, Nanyang Technological University, Singapore

Material convergence occurs when supplies during a disaster arrive in large amounts and consist of mostly unneeded materials. We use a stochastic control model to represent the relief process and mathematically define material convergence. We find simple policies that result in the least negative impact of material convergence.

415

Sunday, 09:45 AM - 11:15 AM, Georgetown West Track: Teaching/Pedagogy in POM

Invited Session: Workshop: Emergency! The ED Operations Simulation Game

Chair(s): Craig Froehle

093-0642 Emergency! The ED Operations Simulation Game

Craig Froehle, Professor, University of Cincinnati, United States

Emergency! is a cooperative, simulation-based, educational game based on an actual Emergency Department. Playing it helps students understand key operations concepts, including the influence of variability on service performance, the role of flexibility in managing service capacity, and the value of shifting capacity in response to unpredictable changes in demand.

416

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

Invited Session: Socially and Environmentally Responsible Operations Management: A Panel Discussion

Chair(s): Basak Kalkanci

093-2444 Socially and Environmentally Responsible Operations Management: A Panel Discussion

Christopher Tang, Professor, University of California Los Angeles, United States
Jayashankar Swaminathan, Professor, University of North Carolina Chapel Hill, United States
Kamalini Ramdas, Professor, London Business School, United Kingdom

Leading OM scholars will share their perspectives on the emerging research area of socially and environmentally responsible operations management.

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

Invited Session: Multi-Product Management

Chair(s): Yalcin Akcay

093-0064 Dynamic Transportation Decisions' Optimization Suite

Manjeet Singh, Research Director, DHL Supply Chain, United States

Dynamic Transportation Decisions' Optimization Suite is an analytics suite which creates a tactical plan to bring transportation solutions through optimization for single shippers and network operations. It solves from most optimal shipment methods to least optimal shipment methods focusing on TL and LTL shipments. The suite contains: Rundtrip, Freight and Pool Optimization tools.

093-0142 Manufacturer Competition Using Supply Functions in a Retail Supply Chain

Edward Anderson, Professor, The University of Sydney, Australia
Houyuan Jiang, Associate Professor, University of Cambridge, United Kingdom
Lusheng Shao, Senior Lecturer, University of Melbourne, Australia

This paper studies contract design between a retailer and two or more competing manufacturers who supply substitutable products to the retailer for sales in a consumer market. The setting we consider involves the same contracts getting used in each period of a planning horizon, which can be in any form.

093-1213 Optimizing Sales and Production Rollover Strategies Under Stochastic Demand and Random Yield

Justus Schwarz, Assistant Professor, University of Mannheim, Germany
Baris Tan, Professor, Koc University, Turkey
Oktay Karabag, Post Doc/Researcher, Technische Universiteit Eindhoven, Netherlands

A product rollover takes place if a product generation is replaced by its successor. We propose a stylized model that captures a stochastic demand and production process, and the substitution effects between generations. Structural insights into the impact of the stochastic variability on the optimal rollover decisions are discussed.

093-1710 On Consumption and Composition of N-Packs

Aydin Alptekinoglu, Associate Professor, Penn State University University Park, United States
John Semple, Professor, Southern Methodist University, United States

We consider the optimal consumption of a pack of n substitutable products within a general random utility framework. Using dynamic programming, we demonstrate that many basic properties of this problem are independent of the error distribution.

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Sunday, 11:30 AM - 01:00 PM, Piscataway Track: Product Innovation and Technology Management

Contributed Session: The interaction of market and technology on innovation

Chair(s): Rashid Khan

093-1068 Social Media and NPD Performance: The Role of Internal Coordination Capability and External Collaboration Capability

Sameer Kumar, Professor, University of St. Thomas, United States
Changyue Luo, Assistant Professor, University of St. Thomas, United States
Debasish Mallick, Professor, University of St. Thomas, United States

Social media use is becoming increasingly popular in NPD, yet the performance impact of social media on NPD remains inconclusive. We use a global database to examine the role of Internal Coordination Capability and External Collaboration Capability on the relationship between social media and NPD performance.

093-2082 Are On-Demand Platforms Winner-Take-All Markets?

David Keith, Assistant Professor, Sloan School of Management, United States
Hazhir Rahmandad, Associate Professor, Sloan School of Management, United States

Multi-sided platforms are often thought to be winner-take-all markets due to strong network effects. We show that behavioral learning of customers provides a sufficient mechanism for multiplatform equilibria, because market-wide utility shocks that affect all platforms encourage switching away from platforms in proportion to their market share.

093-0334 Distributionally Robust Model of Buyers' Welfare -Oriented Product Design Problem Under Uncertainty

Maoqi Liu, Student, Tsinghua University, China
Zhi-Hai Zhang, Associate Professor, Tsinghua University, China
Zheng Li, Professor, Tsinghua University, China

The article establishes a chance-constrained distributionally robust optimization model to maximize customer utility by selecting proper attribute levels of a new product. Our model handles uncertainty from both marketing and engineering aspects in product development and takes the risk attitude about the failure of the development into consideration.

093-2410 Barriers and Motivators of LMS Technology Adoption in Teaching and Learning

Rashid Khan, Lecturer, King Fahad University of Petroleum & Minerals, Saudi Arabia

Technology is growing day by day and there is a need to integrate rapidly changing technology into the educational system. The literature suggests that there is a significant resistance to technology adoption. An exploratory study at DCC revealed barriers and motivators for LMS adoption.

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

Invited Session: Empirical Research and Emerging Topics in OM-Marketing Interface

Chair(s): Yan Dong Zhihao Zhang

093-1482 An Empirical Analysis of Buyer Strategic Ordering Decisions Through a Behavioral Experiment

Minseok Park, Assistant Professor, Salisbury University, United States
Pelin Pekgun, Associate Professor, University of South Carolina, United States
Sriram Venkataraman, Assistant Professor, University of South Carolina, United States
Manoj Malhotra, Professor, Case Western Reserve University, United States

Theoretical literature shows that certain allocation policies can reduce order inflation behavior of buyers, while empirical evidence is scarce. Through a behavioral study, we analyze buyers' ordering decisions in a single-supplier two-buyer supply chain, where the supplier uses a uniform inventory allocation policy, equally distributing available inventory between the buyers.

093-1871 Deleting and Dedicating: The Role and Roots of Product Deletion on Supply Chains

Qingyun Zhu, Student, Worcester Polytechnic Institute, United States
Joseph Sarkis, Professor, Worcester Polytechnic Institute, United States

This presentation integrates multiple literature streams to address product deletion decision implications on the supply chain. Case studies from international companies -- China, Australia, India and the U.S -- contribute to the empirical support in investigating this relationship. Bayesian analysis is utilized to enhance broader methodological understanding.

093-2099 The Role of Corporate Disaster Aid on Firm Performance

Feng Cheng, Student, Arizona State University, United States
Eunae Yoo, Assistant Professor, University of Tennessee Knoxville, United States
Kevin Dooley, Professor, Arizona State University Tempe, United States

As a part of their Corporate Social Responsibility initiatives, firms are increasingly contributing to relief efforts after a disaster. Our paper investigates the benefits that firms earn from engaging in such efforts. We consider impact on a firm’s financial performance as well as its reputation using social media data.

093-1843 How Customers Choose Among Different Products: Organic, Conventional, and Other Attributes

Zhihao Zhang, Student, University of South Carolina, United States
Sriram Venkataraman, Assistant Professor, University of South Carolina, United States
Yan Dong, Professor, University of South Carolina, United States

Using scanner panel data retailers, we examine how customers choose between different attributes of organic and conventional products. In particular, we estimate own-price and cross-price elasticities under different nesting options. Further, we estimate own-elasticity of different variables.

Sunday, 11:30 AM - 01:00 PM

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Sunday, 11:30 AM - 01:00 PM, Northwest — Track: Information Systems and Operations Management

Contributed Session: Data driven decision making

Chair(s): Jayarajan Samuel

093-1293 Optimal Pricing and Product Assignment Under IoT: A Reinforcement Learning Approach

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

IoT enables retailers to monitor quality of products over time. It also offers a new sales channel where consumers can automatically order products through connected physical and digital systems. That raises questions of optimal pricing and product assignment among customers. Weemploy a reinforcement learning algorithm to address the issue.

093-2316 Skin in the Game? Guarantees in Online Labor Markets

Qiang Gao, Assistant Professor, City University of New York, United States
Mingfeng Lin, Associate Professor, Scheller College of Business, United States
Yong Liu, Professor, Eller College of Management, United States

Guarantees are used extensively in product markets. We study whether it is also effective as a potential quality signal in service contexts. Using detailed data from a large online labor market, we examine whether guarantees lead to better outcomes for both sides of the market.

093-1015 Influence of Modern Digital Media on Personal Strivings, Assisting Spiritual Stakeholders' Operations

Shantha Lakshmi Belavadi N Swamy, Student, University of Bedfordshire, United Kingdom
Ramakrishnan Ramanathan, Professor, University of Bedfordshire, United Kingdom
Yanqing Duan, Professor, University of Bedfordshire, United Kingdom

This paper aims to understand the influence of modern digital media characteristics on personal strivings, to control and redesign spiritual stakeholders' operations, and to provide effective sustainable assistance towards spiritual goal strivings. Underpinned by Media Richness Theory, a theoretical framework is developed to understand the significance of their relationship.

093-1370 Optimal Patching of Custom Built Software

Jayarajan Samuel, Assistant Professor, The University of Texas at Arlington, United States
Radha Mookerjee, Senior Lecturer, The University of Texas at Dallas, United States

Keeping large scale, custom built software systems safe from cyber attacks poses unique challenges. Such systems have not been studied in the past. In this paper, we investigate the unique characteristics of such systems and formulate optimal patching policies.

422

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

Invited Session: Hazardous materials transportation

Chair(s): Vedat Verter

093-0538 A Conditional Value-at-Risk Approach to Equitable Routing of Rail Hazmat Shipments

Seyed Hosseini, Post Doc/Researcher, Mcmaster University, Canada
Manish Verma, Associate Professor, Mcmaster University, Canada

We propose a conditional value-at-risk (CVaR) model, as a risk-averse routing plan for multiple rail hazmat shipments and multiple origin-destinations pairs, such that the total transport risk in the given railroad network is minimized, while limiting and equitably spreading the hazmat risk.

093-0910 Pessimistic Evasive Flow Capturing Problem

Aigerim Bogyrbayeva, Student, University of South Florida, United States
Changhyun Kwon, Associate Professor, University of South Florida, United States

We consider a problem, to locate law enforcement facilities to capture unlawful flows. While optimistic bi-level formulations have been studied, we consider pessimistic formulations by relaxing the assumption on the optimizing behavior of unlawful travelers. We introduce a cutting plane algorithm for the pessimistic formulations.

093-1765 A Review on Research in Transportation of Hazardous Materials

Andrea Ditta, Student, Universidad del Norte, Colombia
Oswaldo Figueroa, Student, Universidad del Norte, Colombia
Gina Galindo, Assistant Professor, Universidad del Norte, Colombia
Ruben Yie-Pinedo, Professor, Universidad del Norte, Colombia

Hazmat incidents have the potential of causing significant damages to the affected communities. In this work we review recent research in the field of hazmat transportation. Our work extends a previous review from 2007. Based on our analysis, we identify current trends and future research directions.

093-0504 Coordination in Emergency Response: An Application to Hazardous Materials Transportation

Vedat Verter, Professor, Mcgill University, Canada
Peng Hu, Student, Southwest Jiaotong University, China
Jiahong Zhao, Assistant Professor, Guangdong University of Technology, China

Coordination of multiple resources involved in emergency response is largely overlooked in the literature. This requires not only the response time of each resource, but also the amount of time the teams may have to wait for each other. We present a case study on Chengdu, China.

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424 Sunday, 11:30 AM - 01:00 PM, Jay — Track: Emerging Topics in Operations Management

Invited Session: Novel Integration of Predictive and Prescriptive analytics in Supply Chain Management

Chair(s): David Bergman, Teng Huang

093-0351 Taking Assortment Optimization from Theory to Practice: Evidence from Large Field Experiments on Alibaba

Jacob Feldman, Assistant Professor, Washington University St Louis, United States

We compare the performance of two approaches for finding the optimal set of products to display to customers landing on Alibaba's two online marketplaces: Tmall and Taobao. Both approaches were placed online simultaneously and tested on real customers for one week.

093-2091 Use of Twitter Data for Risk Management in an Organic Food Supply Chain

Shalique Sidhikh, Student, Indian Institute of Management Kozhikode, India
Sidhartha Padhi, Associate Professor, Indian Institute of Management Kozhikode, India
Rupesh Pati, Associate Professor, Indian Institute of Management Kozhikode, India

In this digital era, consumers freely express their opinions and raise concerns online. The data is unstructured, large in volume and scattered. This study utilizes Twitter data to identify risks in an organic food supply chain and map the risk factors to various stakeholders for identifying suitable risk mitigation strategies.

093-2141 A Reinforcement Learning Approach for Hotel Revenue Management

Jun Zhang, Professor, Fudan University, China

We solve a hotel chain's revenue management using reinforcement learning and conduct a field experiment to assess the effectiveness of our approach.

093-2159 Analytics-Driven Response Operations for Infrastructure Resilience

Mathieu Dahan, Student, Massachusetts Institute of Technology, United States
Saurabh Amin, Associate Professor, Massachusetts Institute of Technology, United States
Georgia Perakis, Professor, Massachusetts Institute of Technology, United States

We consider a stochastic orienteering problem with probing constraints to localize network failures after a natural disaster. We develop a predictive failure model, and design a scalable non-adaptive algorithm based on integer programming. We demonstrate the value of utilizing real-world failure data and network properties for improving response operations.

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425 Sunday, 11:30 AM - 01:00 PM, Holmead East — Track: Global Supply Chain Management

Invited Session: Effect of Strategic Operations in Supply Chain Network

Chair(s): Liangliang Xu, Fang Liu

093-0192 Luxury Pricing with Status-Seeking Customers and Strategic Counterfeiters

Zhen Lian, Student, Cornell University, United States
Li Chen, Associate Professor, Cornell University, United States

We study the effects of non-deceptive counterfeits in the luxury market when consumers are status seeking. Without counterfeits, the status effect elevates consumers' demand and increases luxury brands' optimal prices and revenue. With counterfeits, we show that the status effect can be completely negated.

093-0417 Product-From Solutions of General Queueing Networks with Applications to Multi-Source and Expediting Inventory Systems

Jing-Sheng Song, Professor, Duke University Durham, United States
Li Xiao, Assistant Professor, Tsinghua University, China
Hanqin Zhang, Professor, National University of Singapore, Singapore
Paul Zipkin, Emeritus Professor, Duke University Durham, United States

We consider a multi-source inventory system with expediting. Its performance measures can be transformed into finding the steady-state distribution of the queue lengths in the queueing networks. We develop two disciplines for customer arrival and routing from the corresponding queueing networks such that the steady-state distributions have a product-form solution.

093-0629 Reveal the Supplier List? A Trade-Off in Capacity vs Responsibility

Basak Kalkanci, Assistant Professor, Georgia Institute of Technology, United States
Erica Plambeck, Professor, Stanford University, United States

Some buying firms, facing scrutiny regarding social and environmental violations in their suppliers' operations, have recently made commitments to publish the identities of their current and/or terminated suppliers. In this paper, we study the trade-offs faced by a buying firm in deciding whether or not to make such transparent commitments.

093-1245 Sustainable Supplier Development in a Multi-Tier Supply Network

Fang Liu, Assistant Professor, Nanyang Technological University, Singapore
Jeannette Song, Professor, Duke University Durham, United States
Liangliang Xu, Student, Nanyang Technological University, Singapore

Many large firms have initiated sustainable supplier development programs to manage unstable supply and social responsibility issues from their upstream suppliers. Particularly, these programs allow the firms to directly interact with the final tier suppliers. We consider a multi-tier supply network and investigate how these programs may benefit the firms.

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Sunday, 11:30 AM - 01:00 PM, Holmead West — Track: Retail Operations

Invited Session: Retail operations management

Chair(s): Biying Shou

093-0587 Competitive Price-Matching in Multichannel Retailing

Jinpeng Xu, Associate Professor, Xidian University, China
Yufei Huang, Associate Professor, Trinity College Dublin, Ireland
Emmanouil Avgerinos, Assistant Professor, Instituto De Empresa, Spain
Gengzhong Feng, Professor, Xi'an Jiaotong University, China

We consider two retailers selling in both online and offline markets. The retailers compete in the online market, while their offline markets are exclusive to themselves. We study whether they should offer price-matching and how the market structure with price-matching affects retailers' profits, consumer surplus, and social welfare.

093-2100 Win the Buy Box: Reselling or Marketplace?

Hao Su, Student, University of Maryland, United States
Laharish Guntuka, Student, University of Maryland, United States
Martin Dresner, Professor, University of Maryland, United States

This paper examines an e-tailer's decision to offer customers either direct sales or sales through a marketplace. Using empirical analysis, we determine product characteristics that predict the e-tailer's decision to directly sell a product. Findings provide implications to marketplace sellers seeking to avoid direct competition with the e-tailer.

093-0654 Can Busier Servers Make Customers Happier? An Empirical Study at a Restaurant Chain

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

We explore how servers' workload impacts customer satisfaction and thus their repurchasing behavior using a data set of 2.8 million transactions from 25 stores of a full-service casual dining restaurant chain in the US. Our results show that there is a U-shaped relationship between workload and customer satisfaction.

093-1610 Personal Pricing in Social Networks with Strategic Consumers

Biying Shou, Associate Professor, City University of Hong Kong, Hong Kong
Rui Zheng, Post Doc/Researcher, Huazhong University of Science & Technology, Hong Kong

We analyze personal pricing with strategic consumers connected in a social network. Consumers who purchase later can get positive externality from their neighbors who have purchased early, but have to bear a utility discount for the delayed consumption. We derive the optimal pricing policy under general network structures.

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Sunday, 11:30 AM - 01:00 PM, Gunston East — Track: Purchasing and Supplier Management

Invited Session: Leveraging supply networks for competitive advantage

Chair(s): Yusoon Kim

093-0295 How Do Finance Flows Change Along Supply Networks? Evidence from Auto and Food Industries

Yi-Su Chen, Associate Professor, University of Michigan-Dearborn, United States
Yan Xie, Associate Professor, University of Michigan-Dearborn, United States

The effects of supply network on both material and information flows are relatively well documented. In this study, we empirically examine the interplay between supply networks and finance flows - an often overlooked aspect of supply chain management in the auto and food industries. Theoretical and managerial implications are discussed.

093-0305 Tension Between Product Performance and Confidentiality Protection: An Empirical Study of Product Development

Yingchao Lan, Assistant Professor, University of Nebraska Lincoln, United States
John Gray, Associate Professor, Ohio State University, United States
Aravind Chandrasekaran, Associate Professor, Ohio State University, United States
Brett Massimino, Assistant Professor, Virginia Commonwealth University, United States

Much of the extended research has focused on how firms' product development networks help them achieve superior innovation outcomes, but ignored their impact on confidentiality performance. In this paper, we investigate how two key components of network configuration, network centrality, and structural holes affect product and confidentiality performance simultaneously.

093-1091 Network Theory and the Evolution of Market Category Supplier Portfolios

Paul Skilton, Associate Professor, Washington State University, United States

The evolution of supplier portfolios is relevant when high demand categories include a variety of products and product configurations. Network theory helps us predict changes in product offerings, providing insight into supplier bargaining power. The study develops and tests theory using three pharmaceutical categories: opioids, blood pressure treatments, and anti-psychotics.

093-0647 Linking Supply Network Structure to Multi-Dimensional Firm Performance

Surya Pathak, Associate Professor, University of Washington Bothell, United States
Amalesh Sharma, Assistant Professor, Texas A&M University College Station, United States
Sourav Bikash Borah, Assistant Professor, Indian Institute of Management, India
Anirban Adhikary, Assistant Professor, Indian Institute of Management, India

Does a focal firm's supply-network structure affect multiple dimensions of firm-performance? We employ network-rent theory to propose a model and test it using a novel data set on 330 focal firms and their multi-tiered supply networks. Our results support the presence of dark-side and trade-off effects related to supplier collaboration.

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Sunday, 11:30 AM - 01:00 PM, Gunston West — Track: Next Generation Operations

Invited Session: Agricultural Operations

Chair(s): Ying (Maggie) Zhang

093-0125 Intermediation in the Supply of Agricultural Products in Developing Economies

Ehsan Valavi, Student, Harvard University, United States
Kris Ferreira, Assistant Professor, Harvard University, United States
Joel Goh, Assistant Professor, NUS Business School, Singapore

The agricultural industry has been growing in developing economies, yet farmers continue to struggle. Recently, e-intermediaries (fixed-price channels who use technology) have emerged as an alternative channel to the traditional local auctions for which farmers can sell their crop. We study the impact that e-intermediaries have on the supply chain.

093-0695 Traceability in Food Supply Chain Management: The Role of Information Systems

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

Food supply chains are fraught with difficulties in managing contaminations. We study how food safety issues may be overcome through traceability systems when potentially competing supply chain members need to adopt these systems. We analyze specifically the potential benefits that new technologies like blockchain can provide.

093-0898 Conventional Crops or Hops? Optimal Crop Planning and Contract Design Policies with Yield Learning

Heng Chen, Assistant Professor, University of Nebraska Lincoln, United States
Jennifer Ryan, Professor, University of Nebraska Lincoln, United States

With soaring demand for craft beer, hops can offer farmers higher profits than conventional crops, but at the cost of increased demand and yield uncertainty. We formulate a dynamic programming model with yield learning to determine the optimal crop allocation and contract design with the objective of maximizing farm income.

093-0262 Optimal Investment of Farming Mechanization Under Rainfall Uncertainty

Ying (Maggie) Zhang, Assistant Professor, Clemson University, United States
Jayashankar Swaminathan, Professor, University of North Carolina Chapel Hill, United States

We study the procurement of seeds and farm equipment for a single crop in a multi-period planting horizon under budget constraint. In the computational study, we utilize field weather data in Southern Africa to explore the impact of machine cost and farm size on the optimal mechanization investment.

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Sunday, 11:30 AM - 01:00 PM, Fairchild East — Track: POM in Practice

Invited Session: Crowdsourcing and Procurement Contests

Chair(s): C. Gizem Korpeoglu

093-1396 A Model of Learning and Doing in Innovation Contests

Lakshminarayana Nittala, Assistant Professor, University of Dayton, United States
Sanjiv Erat, Associate Professor, University of California San Diego, United States

We conceptualize solvers in an innnovation contest who exert effort on two orthogonal dimensions - (i) "Exploration" or learning more about the solution space, and (ii) "Exploitation" or using the newly created knowledge to deliver a usable solution. We discuss how the focal firm can optimally manage such contests.

093-1647 Technology Evolution Under Competition

Jussi Keppo, Associate Professor, National University of Singapore, Singapore
Jurgen Mihm, Associate Professor, INSEAD, France
Jochen Schlapp, Associate Professor, Frankfurt School of Finance & Management, Germany

How does competition influence a company's choice to exploit exiting technologies or explore new ones? Building on a contest model we explore what aspects of competition foster an environment conducive to technological innovation.

093-1826 Information Design in Dynamic Contests: An Experimental Study

Mohamed Mostagir, Assistant Professor, University of Michigan, United States

We design a novel experiment to study the role of information in dynamic contests where the feasibility of the end goal is uncertain. We examine the effect of different information mechanisms on the designer's objective and the welfare of participants and compare our findings with theoretical predictions.

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Sunday, 11:30 AM - 01:00 PM, Fairchild West — Track: Socially Responsible Operations

Invited Session: New Business Models for Socially Responsible Operations

Chair(s): Luyi Gui

093-0854 Joint Planning of Refueling Stations and Grid Reinforcement for Hydrogen Fuel-Cell Vehicles

Long He, Assistant Professor, National University of Singapore, Singapore
Wei Qi, Assistant Professor, Mcgill University, Canada
Hongcai Zhang, Student, Tsinghua University, China

In this paper, we propose an approach to jointly planning hydrogen refueling stations and power grid reinforcement. Our model explicitly handles the interconnectedness between the transportation and power distribution networks. Furthermore, it captures the complexities of drivers' vehicle choice behavior and renewable energy integration.

093-1439 Rebound Effects Under Manufacturer's Intervention into a Secondary Market

Hailong Cui, Student, Marshall School of Business, United States
Greys Sosic, Associate Professor, Marshall School of Business, United States

We study the manufacturer's intervention in the used product market. Specifically, the manufacturer purchases used products from consumers in the form of trade-in, then refurbishes such products and resells them to consumers. We study the optimal pricing, quality of refurbishing, and the implications on firm's profit and consumer welfare.

093-1715 Rewards Selection in Green Loyalty Programs

Jiayuan Han, Student, Shanghai Univ. of Finance and Economics, China
Wenbin Wang, Associate Professor, Shanghai Univ. of Finance and Economics, China

We study the design of the loyalty program that is used by a green company for customer acquisition. The company offers reward points to customers for every purchase and selects the set of reward products for which these points can be redeemed. We find such a practice could be socially suboptimal.

093-2104 How Do Usage and Payment Behavior Interact in Rent-to-Own Business Models? Evidence From Developing Economies

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

The diffusion of technological innovations in developing economies has been facilitated by the use of rent-to-own business models. We empirically analyze how consumer usage and payment behaviors interact in an application of rent-to-own to the distribution of solar lamps in developing countries.

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Sunday, 11:30 AM - 01:00 PM, Embassy Track: Environmental Operations Management

Contributed Session: Environmental Policy

Chair(s): Marina Baumer-Cardoso

093-0007 Local Embeddedness and Firms' Strategies to Deal with Local Environmental Regulation

Shaohan Cai, Associate Professor, Carleton University, Canada

We argue that a company's local embeddedness will affect its strategy to deal with local environmental regulations. Local embeddedness leads to positive strategies when the firm's resource for environmental management is sufficient, but it leads to negative strategies when the firm does not have sufficient resources.

093-1603 Low Carbon Technology Licensing Between Rival Firms Under Cap-and-Trade Policies

Xu Chen, Professor, University of Electronic Science and Technology of China, China
Xiaojun Wang, Professor, University of Bristol, United Kingdom
Yusen Xia, Professor, Georgia State University, United States

Many studies have emphasized the importance of technology licensing contractual design in accelerating low carbon technology adoption. This paper examines the effect of licensing contractual choices (e.g., royalty, fixed-fee or mixture) and inter-firm relationships (e.g. bargaining power and product differentiation) on two rival manufacturors' sustainability performance under cap-and-trade policies.

093-1504 Sustainable Packaging in Supply Chain Management: A Conceptual Framework

Lavanya Meherishi, Student, National Instituteof Industrial Engineering, Mumbai, India
Sushmita Narayana Aghalaya, Assistant Professor, National Institute of Industrial Engineering, India
KS Ranjani, Assistant Professor, National Instituteof Industrial Engineering, Mumbai, India

This paper develops a conceptual framework for sustainable packaging in the supply chain based on circular economy principles. The paper also presents different theories that encourage adoption of sustainable packaging practices in a supply chain.

093-1453 Overall Circular Effectiveness (OCE): A Company Indicator Considering Circular Economy Aspects

Marina Baumer-Cardoso, Student, Federal University of Santa Catarina, Brazil
Lucila Campos, Associate Professor, Federal University of Santa Catarina, Brazil
Weslynne Ashton, Associate Professor, Illinois Institute of Technology, United States

New measures and targets to accelerate the transition to a Circular Economy are necessary. The Overall Circular Effectiveness (OCE) aims to measure the circularity of a company by analyzing inputs and outputs related to energy, water, and waste. It draws upon Lean Manufacturing and Sustainability frameworks.

432

Sunday, 11:30 AM - 01:00 PM, Du Pont Track: Revenue Management and Pricing

Invited Session: Emerging Areas in Pricing, Revenue Management and Retail Operations

Chair(s): Mehmet Altug Oben Ceryan

093-0328 Revenue Management of Observable Express Queues with Customer Choice

Jiaqi Zhou, Student, University of Maryland, United States
Ilya Ryzhov, Associate Professor, University of Maryland, United States

We consider a stylized model motivated by paid express lanes on highways: two parallel, observable queues, one of which has a faster service rate, but charges a fee to join. Customer choice is based on an MNL model with utility based on observed queue lengths at the time of arrival.

093-0445 Joint Dynamic Pricing and Discounting in the Presence of "Pay-Now" and "Pay-Later" Options

Sajjad Najafi, Post Doc/Researcher, Ross School of Business, University of Michigan, United States
Izak Duenyas, Professor, Ross School of Business, University of Michigan, United States
Ozge Sahin, Associate Professor, Johns Hopkins University, United States

We consider a revenue-maximizing firm pre-selling multiple products over a finite horizon under "Pay-Now" and "Pay-Later" options. Although "Pay-Now" is cheaper, it results in higher penalties if cancelled compared to "Pay-Later". We study how consumers' valuation uncertainty resolution interacts with optimal dynamic pricing of vertically differentiated products.

093-0871 Analysis of a Broker's Procurement Decisions

Itir Karaesmen, Assistant Professor, American University, United States
Ozden Cakici, Assistant Professor, American University, United States

Bidding decisions to procure goods in B2B markets are made under uncertainty and resemble pricing decisions to sell goods in B2C markets. We show how to determine the optimal bid values for a broker.

093-1350 Optimal Dynamic Allocation of Sales and Rental Inventory at a Retailer

Oben Ceryan, Lecturer, Cass Business School, United Kingdom
Mehmet Altug, Assistant Professor, George Washington University, United States

We consider a retailer that simultaneously sells and rents its product over a given horizon. In every period, the retailer faces uncertain demand that splits between renters and buyers. We characterize the optimal dynamic rental allocation policy and study its properties. We propose an implementable heuristic and discuss extensions.

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Sunday, 11:30 AM - 01:00 PM, Cardozo Track: Data Science

Contributed Session: Information and Data Mining

Chair(s): Ye Shi

093-2247 Mining Knowledge From Sequential Patterns

Amin Hosseininasab, Student, Tepper School of Business, United States
Willem-Jan van Hoeve, Associate Professor, Carnegie Mellon University, United States
Andre Cire, Assistant Professor, University of Toronto, Canada

Constrained sequential pattern mining (CSPM) aims at identifying frequent patterns on a sequential database of items while observing constraints defined over the item attributes. We show how CSPM could be used to mine knowledge from applications in marketing, finance and healthcare; complimenting other machine learning algorithms in these fields.

093-2192 Competitive Intelligence From Public Data: Application to Facility Location

Kalyan Talluri, Professor, Imperial College London, United Kingdom
muge tekin, Student, University of Pompeu Fabra, Spain

Econometric analysis is challenging for the restaurant industry since it includes taste, quality and value that are unobservable. To tackle the challenges, we make use of social media, demographic and geographic data to infer an operational decision: the optimal location and design for a restaurant considering the long term benefits.

093-0412 Leveraging Consumer Technology to Learn Demand Information in Lieu of Supply Chain Collaboration

Ye Shi, Post Doc/Researcher, Univ Sci & Technol China, China

We examine a novel program that exploits a mobile phone technology to acquire demand information from consumers. Since the acquired information is censored, we present algorithms to recover it over time. Using data from a manufacturer implementing such a program, we show the value of this program can be substantial.

434

Sunday, 11:30 AM - 01:00 PM, Coats Track: Manufacturing Operations

Contributed Session: Lean, SERU & Competitive Priorities

Chair(s): Feng Liu

093-1243 Lean Manufacturing Practices in Small Manufacturing Industries

Birasnav Muthuraj, Assistant Professor, New York Institute of Technology, United States
Raguramsingh M, Assistant Professor, Sri Krishna College of Technology, India

Studies have given more importance for implementing lean manufacturing practices in the large industries. This study focuses on developing and validating a measure for lean manufacturing practices implemented in small manufacturing industries. In addition, it also examines to what extent these practices are implemented in small industries located in India.

093-1139 Citation Analyses of Industrial and Manufacturing Engineering Journals

Binshan Lin, Professor, Louisiana State University, United States

Journal-level citation statistics for Scopus-indexed industrial and Manufacturing Engineering journals are examined to provide an objective assessment of the citation behavior of journals. Insights will be discussed to help authors better understand the robustness and meaning of journal impact factors and citescores.

093-1781 Competitive Priorities in Operations: An Empirical Investigation Using Confirmatory Factor Analysis

Nambirajan Thangasamy, Professor, Pondicherry University, India
M Prabhu, Assistant Professor, Lebanese French University, Iraq

Authors have examined and focused on the competitive priorities in Union Territory of Puducherry,INDIA. Authors have examined the areas of quality, cost, delivery, flexibility, customer focus, and know-how. Data has been gathered from 350 manufacturing firms. Authors applied Confirmatory Factor Analysis in this research work using LISREL.

093-0356 Solving the Rotating Seru Production Problem with Dynamic Multi-Objective Evolutionary Algorithms

Feng Liu, Associate Professor, Dongbei University of Finance and Economics, China

Today's volatile market conditions in electronic industries have led to a new production system, Seru, a cellular assembly approach, and has been widely implemented in hundreds of Japanese and other Asian companies. To solve the rotating seru production problem, we propose a dynamic multi-objective NSGA-II based memetic algorithm.

435

Sunday, 11:30 AM - 01:00 PM, Columbia 1 Track: Scheduling and Logistics

Contributed Session: Latest Developments in Production Scheduling

Chair(s): Shaya Sheikh

093-0556 Scheduling Robotic Cells with Reinforcement Learning

Hyun-Jung Kim, Assistant Professor, Sungkyunkwan University, South Korea
Jun-Ho Lee, Assistant Professor, ????, South Korea

We address a robotic cell scheduling problem with reinforcement learning. A material handling robot transports jobs between machines in the robotic cell and processing times on the machines have variations. We apply reinforcement learning to determine optimal robot task sequences in order to minimize makespan.

093-2093 Single Machine Scheduling with Random Arrival Time to Minimize the Expected Total Cost

Xun Zhang, Student, Shanghai Jiaotong university, China
Shenghai Zhou, Student, Shanghai Jiao Tong University, China

We consider a single machine scheduling problem with random arrival time, the objective is to set release dates to minimize the expected total cost. We formulate this problem as a distributionally robust program. Numerical experiments shows our program performs very well.

093-0368 Multi-Stage Assembly Flowshop with Setup and Release Time

Shaya Sheikh, Assistant Professor, New York Institute of Technology, United States
Mohamed Komaki, Student, Case Western Reserve University, United States

We explore important performance measures of makespan and total completion time and derive polynomial solutions for special cases of this problem. We also explore lower bounds as well as efficient heuristics for solving proposed problems with the objective of minimizing makespan.

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Sunday, 11:30 AM - 01:00 PM, Columbia 2 Track: Operational Excellence

Invited Session: Tutorial: Predictive Analytics in Operations Management

Chair(s): Ujjal Mukherjee

093-2401 Predictive Analytics in Operations Management

Ujjal Mukherjee, Assistant Professor, University of Illinois Urbana-Champaign, United States
Hessam Bavafa, Assistant Professor, University of Wisconsin-Madison, United States
Han Ye, Assistant Professor, University of Illinois Urbana-Champaign, United States
Ahmet Colak, Assistant Professor, Clemson University, United States

This tutorial/workshop highlights the distinction between explanatory and predictive modeling. In it, we will address the following questions: (i) what is predictive modeling and how is it different from explanatory modeling, (ii) when to use predictive modeling, and (iii) what are the critical issues and limitations associated with predictive modeling.

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Sunday, 11:30 AM - 01:00 PM, Columbia 3 Track: Healthcare Operations Management

Invited Session: Recent progress on healthcare operations management

Chair(s): Diwakar Gupta

093-0209 Models for Understanding the Benefit-Value-Advisor Program

Jingyao Huang, Student, McCombs School of Business, the University of Texas at Austin, United States
Diwakar Gupta, Professor, McCombs School of Business, the University of Texas at Austin, United States

We use game-theoretic models to derive equilibrium prices and insurer cost savings from the Benefit Value Advisor (BVA) program under multiple payment regimes. BVA incentivizes beneficiaries to consult advisers, who recommend low cost-high quality providers for shoppable medical services, without requiring them to follow the advice to earn the incentive.

093-0433 Supply Disruptions in Competing Drug Supply Chain

Parshuram Hotkar, Student, McCombs School of Business, United States
Diwakar Gupta, Professor, University of Texas Austin, United States

We study the impact of information-sharing in a competing supply chain of injectable drugs where the firms are susceptible to a supply disruption. Both firms choose capacities before observing supply disruption. We find that the firms benefit from the visibility of the supply disruption, but the total drug availability decreases.

093-0493 Analysis of the Advance Market Commitment Contract Mechanism

Paola Martin, Student, University of Texas Austin, United States
Diwakar Gupta, Professor, University of Texas Austin, United States
Karthik V. Natarajan, Assistant Professor, University of Minnesota, United States

Advance Market Commitment contracts incentivize pharmaceutical companies to manufacture vaccines for developing countries. We determine equilibrium decisions of two competing manufacturers in response to the global health agency's call for supply offers. We propose a new contract design and show conditions under which this contract dominates the one currently implemented.

093-0569 A Model for a Transplant Center Decision to Enroll a Patient

Ozge Ersoy, Student, The University of Texas at Austin, United States
Diwakar Gupta, Professor, University of Texas Austin, United States

Motivated by observed differences between the characteristics of people that acquire ESRD annually, and the characteristics of potential transplant recipient enrollees (PTRs) at transplant centers (TxCs), we develop econometric and mathematical models to explain TxCs' PTR enrollment decisions.

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Sunday, 11:30 AM - 01:00 PM, Columbia 4 Track: Healthcare Analytics

Invited Session: Healthcare Analytics and Technology

Chair(s): Sezgin Ayabakan

093-0350 Carrot or Stick? Check the Weather First: The Effect of Weather on Mobile-Based Interventions

Nakyung Kyung, Student, K A I S T, South Korea
Sanghee Lim, Assistant Professor, Johns Hopkins University, United States
Byungtae Lee, Professor, K A I S T, South Korea

We provide the results of a field experiment that examines the effectiveness of different mobile-based interventions (i.e., gain, loss, and neutral framed) in different weather conditions. The results show the varying effect of gain-and loss-framed intervention depending on the weather.

093-1982 Digital Multisided Platforms and Women's Health: An Empirical Analysis of Peer-to-Peer Lending and Abortion Rates

Gorkem Turgut OZER, Assistant Professor, University of Maryland, United States
Brad Greenwood , Associate Professor, University of Minnesota, United States
Anand Gopal, Professor, University of Maryland, United States

Despite the emerging literature on societal implications of platforms, the democratization of access to capital by peer-to-peer lending platforms in the healthcare context has yet to be studied. We examine the effects of peer-to-peer lending platforms on the rate of abortions, a medical procedure with significant financial barriers to access.

093-1866 Patient-Sharing Network, EHR Adoption, and Patient Outcomes: An Empirical Investigation

Zhe Deng, Student, Temple University, United States
Sezgin Ayabakan, Assistant Professor, Temple University, United States
Subodha Kumar, Professor, Temple University, United States
Paul Pavlou, Professor, Temple University, United States

Patient-sharing network can be instrumental in shaping physicians' orientation towards clinical practices, which can impact patient outcomes. We empirically analyze the effects of network centrality degree, homophily, and EHR adoption on patient outcomes in the case of multiple physician visits using Maryland's 2.5M in-patient discharge summaries between 2013 and 2017.

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Sunday, 11:30 AM - 01:00 PM, Columbia 5 Track: Healthcare Operations Management

Contributed Session: Healthcare cost and efficiency

Chair(s): Ashok Gopal Balakrishnan

093-1795 Managing Hospital Operating Performance Through Accountability in Utilization Reviews and Information Technologies

John Gardner, Associate Professor, Brigham Young University, United States
Sarah Wasden, Student, University of Utah, United States

This research examines how accountability in utilization reviews relates to patient length of stay and operating cost per bed in 250 U.S. hospitals. Individual and cross-functional accountability are studied. We also analyze how healthcare information technologies relate to and interact with accountability in reviews and their influence on performance.

093-2275 Optimizing the Home-Care Front Office

Nikhil Varma, Assistant Professor, Ramapo College of New Jersey, United States
Berit Irene Helgheim, Associate Professor, Molde University College, Norway

Home-care call centers can become more effective by using a machine assisted triage process. The current systems do not use patient data and interactions effectively which brings in a substantial load to the operations. We study this in the context of home-care in Norway.

093-1769 Investigating opportunities to reduce time spent on indirect activities in home health care process

Line Slyngstad, Student, Molde University College, Norway

Because of population aging and implementation of reforms, home healthcare services have experienced increased demand and expenses. This is a comparative study of Norwegian municipalities, to find out if there are opportunities to reduce time spent on indirect activities.

093-1901 Adoption of Technology in Healthcare Industry in the United Arab Emirates

Dana Al Rahbi, Student, Abu Dhabi University, United Arab Emirates
Mehmood Khan, Associate Professor, Abu Dhabi University, United Arab Emirates

This study explored the motivators and barriers for adoption of technology as identified by four stakeholder groups in healthcare in the UAE: members of society, patients, employees, and future foresight strategists. Numerous interviews with four stakeholders verified that there are commonalities between the motivators and barriers identified by the groups.

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Sunday, 11:30 AM - 01:00 PM, Columbia 6 Track: Healthcare Operations Management

Contributed Session: Lean and process improvement in healthcare

Chair(s): Urban Wemmerlov

093-0847 Analysis and Improvement of Patient Flow Performance Using of TOC, Lean, and Simulation Approach

Danilo memphis, Professor, Saginaw Valley State University, United States
Luiz Simão, Professor, Univali, Brazil

This work aims to demonstrate how to improve the flow of patients in the emergency department (ED) of a children's hospital in Brazil using the theory of constraints and lean healthcare approach, analyzing their impact with a discrete event simulation tool.

093-1570 Application of Jugaad Concept in Healthcare

Sanjeev Bordoloi, Associate Professor, University of St. Thomas, United States
Sathiyavani Chandran, Student, University of St. Thomas, United States

The concept of Jugaad is related to Lean and Project Management. Jugaad refers to flexible and quick innovation, driven by scarce resources and attention to customer's immediate needs. We explore how Jugaad can be used in healthcare for more effective operations and offer metrics to measure benefits of Jugaad.

093-0803 Deconstructing Value-Based Healthcare (VBHC)

Urban Wemmerlov, Professor, University of Wisconsin Madison, United States
Mandar Dabhilkar, Associate Professor, Stockholm University, Sweden

The terms Value and Value-Based Healthcare (VBHC) appear frequently in the current literature. We're discussing what the terms mean, how VBHC relates to other forms of improvement initiatives, what work has been done in the VBHC domain, where VBHC is going, and what additional research is needed.

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Sunday, 11:30 AM - 01:00 PM, Columbia 7 Track: Supply Chain Management

Contributed Session: Reviews and Potentials in the Supply Chain Management Research

Chair(s): Ziaul Haque Munim

093-1381 Supply Chain Management Outsourcing: A Bibliometric Analysis and Critical Review

dhanavanth reddy maditati, Student, Vienna Univ of Econ & Business Admin, Austria
Ziaul Haque Munim, Associate Professor, U of Agder & U of South-Eastern Norway, Norway
Hans-Joachim Schramm, Senior Lecturer, Vienna Univ of Econ & Business Admin, Austria
Sebastian Kummer, Professor, Vienna Univ of Econ & Business Admin, Austria

Adopting systematic literature review approach, 287 articles on “supply chain services” are selected. Bibliometric analysis is performed using Bibliometrix, an R-tool, and the top 50 articles are used to map the intellectual structure of the research field. Further, a content analysis helped reveal future research avenues through a critical review.

093-1465 Paradoxical Elements in Operations and Supply Chain Management: A Systematic Literature Review

Mehmet Yalcin, Assistant Professor, University of Rhode Island, United States
Jiayuan Zhang, Student, University of Rhode Island, United States
Douglas Hales, Professor, University of Rhode Island, United States

Seemingly irreconcilable tensions are what operations and supply chain managers (OSCM) must routinely deal with; such as flexibility versus efficiency and just in time versus traditional manufacturing. Grounded with Paradox Theory, we conduct a systematic literature review within the OSCM context to extract those interdependent elements which possess persistent contradictions.

093-0739 Frameworks and Theories on Sales and Operations Planning (S&OP)

Márcio Thomé, Assistant Professor, Pontifícia Universidade Católica do Rio de Janeiro - PUC-Rio, Brazil
Tobias Kreuter, Student, University of Muenster, Germany
Bernd Hellingrath, Professor, University of Muenster, Germany
Luiz Felipe Scavarda, Associate Professor, Pontifica Universidade Catolica Do Rio De Janeiro- Puc Rio, Brazil

The paper reviews frameworks and general theories in empirical research in S&OP, based on a Scopus and Web of Sciences systematic literature review. Most S&OP research is a-theoretical with a prevalence of framework and maturity model-based empirical research. Most commonly encountered and relevant frameworks and theories are reviewed.

093-1377 Supply Chain Services in Emerging Countries

Ziaul Haque Munim, Associate Professor, U of Agder & U of South-Eastern Norway, Norway
dhanavanth reddy maditati, Student, Vienna Univ of Econ & Business Admin, Austria
Sebastian Kummer, Professor, Vienna Univ of Econ & Business Admin, Austria

Adopting service dominant logic, this empirical study attempts to find if the emerging countries (India) are lagging in terms of supply chain services serving manufacturing sector, in comparison to developed countries (DACH). Further, the survey focuses on investigating the gap in terms of operant resources required to offer lagging services.

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Sunday, 11:30 AM - 01:00 PM, Columbia 8 Track: Supply Chain Management

Invited Session: Sourcing issues in Supply Chains

Chair(s): Wc Benton

093-0124 Assessing for Unit Non-Response Bias in Dyadic Survey-Based Supply Chain Management Research

Toyin Clottey, Associate Professor, Iowa State University, United States
Wc Benton, Professor, Ohio State University, United States

A survey of 75 research papers with dyadic data, published in five empirically-focused SCM academic journals over the last decade, reveals a lack of agreement on methods used in the assessment of unit non-response bias. We provide recommendations for setting up a MANOVA for the assessment with sample size implications.

093-0623 Supplier Shirking Opportunism as Supply Disruption Trigger

Rahul Pandey, Student, Ohio State University, United States
Johnny Rungtusanatham, Professor, Ohio State University, United States
Wc Benton, Professor, Ohio State University, United States
Thomas Goldsby, Professor, Ohio State University, United States

We explore the association of intentional trigger of supply disruption, specifically supplier shirking opportunism (SO), with frequency of supply disruption a firm experiences. As expected, SO increases supply disruption frequency. We further explore and find that buying firms may leverage asymmetry in buyer-supplier relationship investments to reduce supplier shirking opportunism.

093-0678 Estimation of Expected Revenue for an Optimal Sales Planning

Sangjoon Lee, Student, Korea University, South Korea
SooHoon Park, Assistant Professor, Bemidji State University, United States
Hojung Shin, Professor, Korea University, South Korea

We attempt to estimate the expected revenue by combining the effect of time and product of each show in a TV home shopping channel and the forecasting performance of the suggested model is compared to that of an existing forecasting model in a firm.

093-0813 Relational Capital or Relational Liability? Effects of Operational Capability and Relationship Characteristics on Supplier Profits

Yoon Hee Kim, Assistant Professor, Georgia Southern University, United States
Morgan Swink, Professor, Texas Christian University, United States

The relational view argues that firms can maximize rents by combining internally owned capabilities and externally available resources through cooperative relationships. Using a large-scale secondary data on buyer- supplier relationships (BSRs), this study investigates whether and how operational capability and the characteristics of BSRs generate synergistic effects on supplier profitability.

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Sunday, 11:30 AM - 01:00 PM, Columbia 9 Track: Behavioral Operations Management

Invited Session: Trust and Bounded Rationality

Chair(s): Ozalp Ozer xiaolin Li

093-0817 The Role of the Regulator in Optimal Recall Decisions

Rodney Parker, Associate Professor, Indiana University Bloomington, United States
George Ball, Assistant Professor, Indiana University Bloomington, United States
Ruth Beer, Assistant Professor, Indiana University Bloomington, United States

We model a firm's optimal recall decision under the threat of a regulator mandated recall, showing a mandated recall implies diminished trust by consumers, inducing an earlier voluntary recall. With a behavioral study, we confirm a mandated recall significantly reduces consumer repurchase intent, but only for female consumers.

093-1522 The Blessing of Bounded Rationality in Distribution Channels

Tony Haitao Cui, Associate Professor, University of Minnesota, United States
Lei Zhuang, Student, University of Minnesota, United States
Yusong Wang, Associate Professor, Fudan University, China

We incorporate bounded rationality into a model of dyadic channel and show that the lack of best response from cost-plus pricing due to firms' bounded rationality can be a blessing for both retailer and the channel. More interestingly, all channel members can benefit from the retailers cost plus pricing practice.

093-2117 Lifting the Veil: The Benefits of Cost Transparency

Bhavya Mohan, Student, Harvard Business School, United States
Ryan Buell, Associate Professor, Harvard Business School, United States
Leslie John, Assistant Professor, Harvard University, United States

Firms do not typically disclose information on their costs to produce a good to consumers. However, we provide evidence of when and why doing so can increase consumers' trust in the firm, increasing their purchase interest.

093-0822 Are We Strategically Naïve or Guided by Trust in Cheap-Talk Communication?

xiaolin Li, Assistant Professor, UT Dallas, United States
Ozalp Ozer, Professor, University of Texas Dallas, United States
Upender Subramanian, Associate Professor, University of Texas Dallas, United States

In this paper we provide the first direct comparison of two distinct behavioral economic theories, the level-k model and the trust-embedded model, in explaining how cheap talk works between human decision makers in the same unified context. We show that the two models make characteristically distinct and empirically distinguishable predictions.

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Sunday, 11:30 AM - 01:00 PM, Columbia 10 Track: Product Innovation and Technology Management

Invited Session: Innovation Management in Supply Chains and Supply Networks

Chair(s): Adegoke Oke

093-1152 Supply Chain Strategy in Nascent Markets

Javad Feizabadi, Associate Professor, Malaysia Institute for Supply Chain Inno, Malaysia

Adopting grounded theory design, qualitative data is collected from stratups in nano, bio, and ICT sectors to explore how process innovation could contribute in innovative business models and mitigating ambiguity. The research shows in contrast to extant literature, the product and process innovations should not be considered sequentially.

093-0287 Effect of Suppliers' Mergers on Buyer's Innovation Performance

Wenjin Hu, Student, Zhejiang University, China
Yan Dong, Associate Professor, University of South Carolina, United States
Yongyi Shou, Professor, Zhejiang University, China

This paper intends to examine the effect of suppliers' mergers on buyer's innovation performance. The results of this paper suggest that suppliers' mergers can influence focal firm's innovation performance. This paper also finds that the effect can be moderated by some contextual factors.

093-1943 Additive Manufacturing Operations in a Developing, Reactive Capacity Country to Supply Uncertain Demand

Miguel Estrada, Professor, Ipade Business School, Mexico

This work describes some critical variables that influence the decision to take advantage from additive manufacturing and applying it in a developing country. The reactive capacity could produce value in an uncertain demand scenario. However, this requires a specific process that takes advantage of the same additive manufacturing technologies.

093-1128 Timing of Service Updates: Evidence From Innovative Digital Services

Seongkyoon Jeong, Student, Arizona State University, United States
Adegoke Oke, Associate Professor, Arizona State University Tempe, United States

This study empirically investigates the patterns of the life cycle curves of innovation-driven online services. Findings show a shift from the traditional "bell-shape" curve to a "shark fin" curve due to information availability and content-dependency. Services updates result in a "saw-tooth" pattern curve that extend the life cycle.

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Sunday, 11:30 AM - 01:00 PM, Columbia 11 Track: Inventory Management

Invited Session: Algorithms and Analysis for Inventory Management

Chair(s): Qiong Wang

093-0673 Asymptotic Optimality of Base-Stock Policies for Perishable Inventory Systems

Jinzhi Bu, Student, The Chinese University of Hong Kong, Hong Kong
Xiting Gong, Assistant Professor, The Chinese University of Hong Kong, Hong Kong
Xiuli Chao, Professor, University of Michigan - Ann Arbor, United States

We consider a simple base-stock policy (BSP) for the infinite-horizon perishable system. Besides establishing an explicit performance bound for the BSP, which indicates the exponential convergence rate of the optimality gap in lifetime and demand size, we also prove that the BSP is asymptotically optimal as the penalty cost grows.

093-0954 Understanding the Value of Fulfillment Flexibility in an Online Retailing Environment

Levi Devalve, Student, Duke University Durham, United States
Yehua Wei, Assistant Professor, Boston College, United States
Di Wu, Principal Scientist, Not given, United States
Rong Yuan, Student, Not given, United States

We assess the value of online retailing fulfillment networks with different degrees of flexibility. Motivated by practical constraints, we propose an intuitive spillover limit policy that is asymptotically optimal under a general setting. Using this policy, we estimate a significant cost decrease for our industrial collaborator.

093-1117 Substitutability, M-Natural-Convexity and Their Applications

Xin Chen, Professor, Industrial & Systems Engineering, United States
Menglong Li, Student, Industrial & Systems Engineering, United States

Substitutability, an important concept in economics and operations research, poses significant technical challenges. In this paper, we build fundamental properties of M-natural-convexity and its variant SSQM-natural-convexity, and apply them to analyze a multi-product multi-period stochastic inventory model and a portfolio contract model.

093-1955 Reoptimization Algorithms for Contextual Bandits with Knapsack Constraints

Zhen Xu, Student, Columbia University, United States
Van-Anh Truong, Assistant Professor, Columbia University, United States

We study new algorithms for Contextual Bandits with Knapsack. There are finitely types of customers, products, and resources with finite capacity. Products made from resources will generate a random reward depend on the customer's type. The objective is to learn the reward and make online decisions to minimize the loss.

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Sunday, 11:30 AM - 01:00 PM, Columbia 12 Track: Service Operations

Contributed Session: Management of Queues and Service Supply Chain

Chair(s): Enrico Secchi

093-0415 Typology of Suppliers in Service Firms: Effects on Service Supply Chain Design

Syed Aamir Ali Shah, Post Doc/Researcher, Lahore University of Management Sciences, Pakistan
Kamran Chatha, Associate Professor, Lahore University of Management Sciences, Pakistan

The paper seeks to conceptually develop and test a two-dimensional (nature of interaction relative to nature of appointment) typology matrix, representing four main clusters of suppliers in service firms. Based on this matrix, the paper discusses the supply base issues for each class of suppliers in service supply chain design.

093-0077 Does Social Media Improve Service Operations Resilience? The Case of Passenger-Rail Transport

Daniel Eyers, Lecturer, Cardiff University, United Kingdom
Andrew Potter, Associate Professor, Cardiff University, United Kingdom
Shupeng Huang, Student, Cardiff Business School, United Kingdom

This study examines whether resilience in transport operations can be improved using social media data. We focus on the UK rail network, and by combining a database of 3.5 million tweets with rail operator data, conduct topic modelling and sentiment analysis to identify whether social media data may enhance resilience.

093-1446 Opaque Queues: Service Systems with Rationally Inattentive Customers

Tamer Boyaci, Professor, ESMT Berlin, Germany
Caner Canyakmaz, Post Doc/Researcher, ESMT Berlin, Germany

Many service systems are "opaque" in that customers cannot discern precise queue lengths upon arrival due to information frictions and/or cognitive restrictions. We model this using rational inattention theory and develop a strategic queuing framework that naturally bridges observable and unobservable queues. We characterize equilibrium behavior and demonstrate welfare implications.

093-2281 Procedural Justice of Priority Queues: Is it Okay if I Skip This Line?

Mike Dixon, Assistant Professor, Utah State Univ, United States
Megan Albrechtsen, Student, Utah State University, United States

Organizations have started offering customers “fast pass” access by dedicating resources to priority queues in hopes that satisfaction will increase. We question the assumption that shorter wait times always lead to higher satisfaction in light of procedural justice concerns of priority access.

093-1065 Service Delivery Process Design: A Systematic Literature Review

Enrico Secchi, Assistant Professor, University College Dublin, Ireland

Service delivery processes play a pivotal role in shaping the interactions of service systems and customers. This paper provides a systematic literature review of the empirical studies on the design of service delivery processes to present the current state of knowledge and identify fruitful directions for future research.

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Sunday, 11:30 AM - 01:00 PM, Monroe Track: Humanitarian Operations and Crisis Management

Invited Session: Conceptual Framework / Application Driven Research in Humanitarian Operations

Chair(s): Raktim Pal

093-1760 Impact of Cultural Differences on Humanitarian Relief Activity

Leo Hong, Student, University of Rhode Island, United States
Gulver Karamemis, Assistant Professor, University of Rhode Island, United States
Raktim Pal, Professor, James Madison University, United States
Koray Ozpolat, Associate Professor, College of Business, United States

Humanitarian Aid Organizations’ (HAOs) transaction costs and performance greatly vary across different regions they serve. Hence, identifying culturally appropriate practices is of paramount importance for both aid agencies and beneficiaries. We empirically study the impact of cultural differences between the two parties on humanitarian relief performance.

093-2295 Humanitarian Operations Modeling at the Interplay of Relief and Development

Nico Vandaele, Professor, KU Leuven, Belgium
Catherine Decouttere, Student, KU Leuven, Belgium
Kim De Boeck, Student, Katholieke Universiteit Leuven, Belgium

We explore a personal view on how OR modeling can support humanitarian relief and development decision making. Relying on the fields of immunization and HIV, we show that these systems have to cope both with prevention (development) as well as with outbreaks (disaster relief).

093-0016 Mobile Money Agent Inventory Pooling

Karthik Balasubramanian, Assistant Professor, Howard University School of Business, United States
Jason Acimovic, Assistant Professor, Penn State University State College, United States
David Drake, Assistant Professor, University of Colorado, United States

Mobile money has allowed millions to send and receive money with mobile phones. However, mobile money agents, who perform the critical functions of converting cash to electronic value and vice versa, often experience stockouts. This paper proposes an inventory pooling framework, and evaluates it with Zambian Data.

093-1191 The Role of Agility and Resilience in Disaster Relief Operations

Rameshwar Dubey, Associate Professor, Montpellier Business School, France

In this study we provide nuanced understanding of two desired properties of humanitarian supply chain: agility and resilience. We support our arguments using survey based data gathered from relief organizations to understand the role of agility and resilience on humanitarian supply chain performance.

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Sunday, 11:30 AM - 01:00 PM, Lincoln East Track: Humanitarian Operations and Crisis Management

Contributed Session: Donations and Funding for Humanitarian Relief

Chair(s): Felix Papier

093-0510 Operational Transparency on Crowdfunding Platforms: Effect on Donations for Emergency Response

Jorge Mejia, Assistant Professor, Indiana University, United States
Gloria Urrea, Post Doc/Researcher, Indiana University, United States
Alfonso Pedraza-Martinez, Associate Professor, Indiana University, United States

Crowdfunding campaigns have two transparency tools to increase donations: updates and certification. Updates are a form of operational transparency when they communicate campaign's work. Certification is a form of conventional transparency. Using a mixed-methods approach, we investigate the effect of operational transparency on donations and the mechanisms behind this effect.

093-0624 Influencing Donation Choice in Social Networks After Disasters

Trilce Encarnacion, Student, Rensselaer Polytechnic Institute, United States
Jose Holguin-Veras, Professor, Rensselaer Polytechnic Institute, United States

In order to effectively influence donation choice in a social network setting after disasters, a network influence model is formulated, incorporating behavior research regarding individuals' attitudes. Operations research techniques are used to select an appropriate influencing strategy to effect change in donation choice towards better donation practices after disasters.

093-1461 An Integrated Financial and Logistical Game Theory Model for Humanitarian Organizations

Anna Nagurney, Professor, University of Massachusetts Amherst, United States
Mojtaba Salarpour, Student, University of Massachusetts Amherst, United States
Patrizia Daniele, Professor, University of Catania, Italy

A game theory model for disaster relief is constructed that incorporates financial and logistical aspects of humanitarian organizations involved in the purchase and delivery of relief items, post-disaster, using freight services, under budget, capacity, and demand constraints. The framework is applied to Hurricane Harvey hitting Houston.

093-1780 A VR Disaster Donation Simulator for Promoting Cash Donation

Hee Yoon Kwon, Student, University of Rhode Island, United States
Koray Ozpolat, Associate Professor, College of Business, United States

We create an interactive VR experience to inform the decision of the public towards donating cash to help international disaster survivors. The user makes donation decisions as a donor and then faces the various implications of those decisions as a humanitarian worker.

093-1882 Budget Allocation in International Humanitarian Organizations

Milad Keshvari Fard, Post Doc/Researcher, Department of Decision Sciences, Canada
Felix Papier, Professor, Department of Operations Mangament, France
Ivana Ljubic, Professor, Department of Decision Sciences, France

In this research we investigate the problem of budgeting in an international humanitarian organization (IHO). The specific utility function of IHOs, uncertainty in donations, and earmarked funding renders budget allocation a challenging task. We model the problem as a stochastic programming and identify several finding regarding earmarked donations.

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Sunday, 11:30 AM - 01:00 PM, Lincoln West Track: Empirical Research in Operations Management

Invited Session: E-Business

Chair(s): Meng Li Ruomeng Cui

093-0321 Does Information Help Agents Perform Better?: A Mobile Money Field Experiment in Tanzania

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

Mobile money allows consumers without physical bank accounts to conduct financial transactions through wireless providers. Transactions are performed by agents who decide how much physical and electronic cash to stock. We implement an experiment in Tanzania to test whether sending explicit recommendations or informative estimates of volume are better.

093-0383 When Transparency Fails: Bias and Financial Incentives in Ridesharing Platforms

Jorge Mejia, Assistant Professor, Indiana University, United States
Chris Parker, Assistant Professor, Penn State University University Park, United States

Passenger discrimination in transportation systems is a well-documented phenomenon. We conduct a field experiment to determine whether recent changes to ridesharing platforms removed the biased behavior. Our results show that racial and LGBT biases are persistent. We find a moderating effect of peak pricing with consistently lower cancelation rates.

093-0886 Human Trafficking in Supply Chains: Corporate and Competitor Network Effects

Pia Ramchandani, Student, University of Pennsylvania, United States

Leveraging news article coverage on human rights abuses, we provide insight into how public scrutiny on these violations impacts individual companies and how that effect propagates through peer competitor networks. Our results provide insights for designing industry-specific policy interventions based on externalities on peer competitors, supplier networks, and consumer memory.

093-0938 Return Policy Generosity, Price, and Demand in Online Retailing

Alan Pritchard, Assistant Professor, Texas Tech University, United States
Robert Windle, Professor, University of Maryland, United States
Philip Evers, Associate Professor, University of Maryland, United States
Guangzhi Shang, Assistant Professor, Florida State University, United States

Using a unique dataset, the value of a generous return policy is examined from both the buyer's and seller's perspectives.

093-2086 Ratings and Version Updates in the Mobile App Market

Gad Allon, Professor, The Wharton School, United States
Ken Moon, Assistant Professor, The Wharton School, United States
Amandeep Singh, Student, The Wharton School, United States

Mobile apps release version updates, motivating interest in agile operational responses to app store ratings. We characterize the optimal strategy for timing such updates and structurally estimate the extent to which developers are agile, exhibiting both reactive capacity and responsiveness to customer feedback. We discuss implications for platform design.

450

Sunday, 11:30 AM - 01:00 PM, Jefferson East Track: Retail Operations

Contributed Session: Trends, Online & Omni-channel retailing

Chair(s): Sangdo Choi

093-0880 Optimal In-Store Fulfillment of Online Orders in an Omni-Channel Environment

Rita Difrancesco, Assistant Professor, Eada Business School , Spain
Matthias Winkenbach, Assistant Professor, Massachusetts Institute of Technology, United States
Isabelle van Schilt, Student, Delft University of Technology, Netherlands

The rise of e-commerce drives an increased need for responsive omni-channel fulfillment, creating new challenges in inventory management and fulfillment. We use simulation-based optimization to prescribe inventory and fulfillment policies for online orders from physical stores. We apply our method to a case study from a leading sporting goods retailer.

093-2206 E-Word of Mouth on Action: Analysis of Operational Decisions in an Online Shopping System

Nesim Erkip, Professor, Bilkent University, Turkey
Bahar Cavdar, Assistant Professor, Middle East Technical University, Turkey

We consider an e-tailer offering different types of services where demand for each service type is endogenous to operational decisions through word-of-mouth (WoM). Building on the behavioral and operations management literature, we characterize the e-tailer's optimal policy and long-term behavior of customer demand.

093-1998 The Future of Omni-Channel Retail – An Operational Perspective

Joydeep Paul, Student, Erasmus University Rotterdam, Netherlands
Niels Agatz, Associate Professor, Erasmus University Rotterdam, Netherlands
Jan Fransoo, Professor, Kuehne Logistics University, Germany

We study the synergies and competition between online and offline sales channels in omni-channel grocery retail. We model the trade-offs in the design of the omni-channel fulfilment strategy with a specific focus on the economies of scale in the various fulfillment operations.

093-0071 Industry Analysis for Retail/Wholesale Business

Sangdo Choi, Assistant Professor, Christopher Newport University, United States
Philip Chung, Assistant Professor, Christopher Newport University, United States

We analyze U.S. retail/wholesale industry using an Earns-Turns Matrix. Competitions have risen across industries (e.g., e-retail, wholesale, retail, department). Walmart increases its size (i.e., revenue) most, Amazon improves profitability, and Macy's takes longest in cash-conversion cycle, respectively. We analyze industry trends and characterize retail/wholesale industry.

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Sunday, 11:30 AM - 01:00 PM, Jefferson West Track: Supply Chain Risk Management

Contributed Session: Supply Chain Risk and Network Design

Chair(s): Yuli Zhang

093-0677 A Reliable Facility Location Problem with Wasserstein Ambiguity Set

Ruiwei Jiang, Assistant Professor, University of Michigan Ann Arbor, United States
Kanglin Liu, Student, Tsinghua University, China
Zhi-Hai Zhang, Associate Professor, Tsinghua University, China

We study a two-stage distributionally robust reliable facility location problem. The probability distribution of facility disruption is chosen within a Wasserstein distance from empirical distribution. The worst-case distribution is derived based on the problem's special properties. In the end, a benders decomposition algorithm is proposed to solve the problem.

093-1463 Network Structure and Supply Chain Risk Propagation: A Theoretical Framework

Myles Garvey, Assistant Professor, William Paterson University, United States
Steven Carnovale, Assistant Professor, Rochester Institute of Technology, United States
Sengun Yeniyurt, Associate Professor, Rutgers University, United States

The extant literature has explored the connection between supply network structure and other supply chain performance constructs. However, there has been little to no work in the connection between network structure and risk propagation. In this research, we explore connections between canonical network structure and risk propagation.

093-1666 A Stochastic Programming Approach to Design Perishable Product Supply Chain Network Under Disruption and Uncertainty

Pravin Suryawanshi, Student, Indian Institute of Technology Bombay, India
Pankaj Dutta, Assistant Professor, Indian Institute of Technology Bombay, India

Emergence of risk in today's business environment is affecting every managerial decision in Supply Chain (SC) operations. We developed a two stage stochastic programming model to deal against demand uncertainty and supplier disruption for a perishable product SC. Numerical results are presented for a real-life case study of kiwi fruit SC.

093-2376 Dynamic Facility Location and the Value of Inventory Mobility in Disaster Relief

Amber Richter, Quantitative Analyst, Google, United States
Zuo-Jun Max Shen, Professor, University of California Berkeley, United States
George Shanthikumar, Professor, Purdue University, United States
Yuli Zhang, Associate Professor, Beijing Institute of Technology, China

This paper considers a dynamic inventory relocation problem for responding to disasters over time. Specifically, we examine how to optimally relocate a single mobile inventory over time to serve stochastic demand at several potential disaster sites. The presented model and results are applicable to any type of mobile inventory system.

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Sunday, 11:30 AM - 01:00 PM, Georgetown East Track: Supply Chain Risk Management

Invited Session: Supply Chain Disruption, Competition and Behavioral Impact

Chair(s): Lijun Ma

093-2380 The Impact of Decision Maker's Behavior on Supply Chain Resilience

Chung-Yean Chiang, Assistant Professor, University of South Carolina Upstate, United States

Recent political or social crisis events, especially caused by the leadership, highlight the degree of the supply chain vulnerability. We investigate the impact of industry market concentration on the firm's ability with adventurous decision makers to decide where extreme disruptions in sequential supply chain investment decisions are likely to occur.

093-0372 Impact of Competition on Pricing and Tracking Capability Under Customer Preference

Xia XIE, Student, Huazhong University of Science & Technology, China
Bin Dai, Professor, Wuhan University, China

In this study, considering the preference difference between pricing and traceability, we investigate the impact of competition on the optimal pricing and tracking capability. Results show that the optimal tracking strategy is a threshold policy of the tracking cost and the market size and competition affects the thresholds values.

093-0222 Impact of Supply Chain Disruptions on Competitors

Laharish Guntuka, Student, University of Maryland, United States
Adams Steven, Assistant Professor, University of Maryland, United States

We investigate the spillover effect of supply chain glitches on competitor firms who, themselves, are not involved in the glitch. Measured through abnormal returns, the competitors gain when a firm announces a major glitch, but the gain is watered down by the number of shared suppliers.

093-1617 Chain-to-Chain Competition with Overcon?dent Decision Makers

Lijun Ma, Professor, Shenzhen University, China
Ruina Yang, Associate Professor, Xi'An Jiaotong University, China

In this paper, we study the e?ects and implications of overcon?dence in a chain-to-chain competition setting. We model the overcon?dence the decision makers have as if the outcome of an uncertain event is less risky than it really is.

453

Sunday, 11:30 AM - 01:00 PM, Georgetown West Track: Teaching/Pedagogy in POM

Invited Session: Panel: Managing Large-Size Classes

Chair(s): Mabel C. Chou

093-2417 Managing Large-Size Classes

Mabel C. Chou, Associate Professor, National University of Singapore, Singapore
Simon Jones, Publisher - Decision Sciences, ELSEVIER, United Kingdom
Qizhang Liu, Senior Lecturer, National University of Singapore, Singapore
Kevin Shang, Professor, Duke University Durham, United States
Yao Zhao, Professor, Rutgers University, United States

It requires special arrangements and novel teaching methods to manage large classes. This panel session aims to provide a platform for the panelists and the participants to share their experiences in how to engage students more effectively, as well as the teaching materials and tools that can facilitate learning better.

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Sunday, 11:30 AM - 01:00 PM, Cabinet — Track: Sustainable Operations

Contributed Session: Sustainable Transportation

Chair(s): Miguel Jaller

093-1486 Assimilating Enablers of Sustainable Freight Transportation in Perishable Commodity Supply Chains-Graph Theoretic and ISM Approach

Prs Sarma, Assistant Professor, Indian Institute of Management Raipur, India

Present research attempts to integrate the considerations of SFT with that of perishable commodities. ISM was used for modelling enablers related to both the problems and their interaction was graphed. Quantification of performance measures consider the interplays of these enablers' sustainability and perishability is also carried out employing Graph Theoretic Approach.

093-1868 Planning the Oorganization of Road Port Access: The Case of the Port of Santos

Wilson Hilsdorf, Assistant Professor, Centro Universitario Da Fei, Brazil

Murillo Caldeira, Student, Centro Universitario Da Fei, Brazil

This study aims to analyze the road access method effectiveness adopted in the Port of Santos, comparing with other ports located in developed countries. The study concludes that the truck parking yards are the most effective logistic strategy, while the truck restriction method is the most effective environmental strategy.

093-2162 Evaluating The Environmental Impacts of Online Shopping: A Behavioral and Transportation Analysis

Miguel Jaller, Assistant Professor, University of California Davis, United States

Anmol Pahwa, Student, University of California Davis, United States

This study estimated behavioral models to understand the factors affecting shopping decisions, in general, and in-store and online, in particular. The authors implement the models in two metropolitan areas to estimate the potential vehicle miles traveled and environmental emissions. Finally, they study the impacts of rush deliveries and consolidation levels.

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Sunday, 11:30 AM - 01:00 PM, Intl Ballroom East — Track: Supply Chain Analytics

Invited Session: Prescriptive Analytics in Supply Chain Management

Chair(s): Justin Jia

093-0365 Measuring the Financial Impact of Free Shipping Threshold Policy

Gerard Cachon, Professor, The Wharton School, University of Pennsylvania, United States

Santiago Gallino, Assistant Professor, The Wharton School, United States

Xu Joseph (Jiaqi), Assistant Professor, Carnegie Mellon University, United States

We develop a data-driven model to measure the financial impact of an online retailer's free shipping threshold policy. We consider the policy's effects on (i) customer activation, (ii) repeat purchase, and (iii) average profit per order. We apply the model to transaction data from an online retailer to offer recommendations.

093-1492 Early-Stage Cancer Detection Using a Liquid Biopsy

Jackie Baek, Student, Massachusetts Institute of Technology, United States

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

Andrew Li, Assistant Professor, Carnegie Mellon University, United States

Deeksha Sinha, Student, Massachusetts Institute of Technology, United States

With the tremendous reduction in DNA sequencing costs, there have been recent developments to design a blood test for early-stage cancer detection. As sequencing can only be performed affordably on a fraction of a genome, a massive variable selection problem remains. We provide an efficient algorithm for this problem.

093-2235 Bayesian Business Analytics for Supply Chain Insight

Adam Fleischhacker, Associate Professor, University of Delaware, United States

We introduce a complete Bayesian business analytics workflow for modelling supply chain performance. Using probabilistic graphical models, Hamiltonian Markov Chain Monte Carlo, and data visualization, we share our workflow and the succeeding insights drawn from a manufacturer's dataset of product movements.

093-1105 Sufficient Statistics and Structured Solutions of Prescriptive Analytics

Justin Jia, Assistant Professor, Purdue University, United States

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

This study shows that in many prescriptive analytics (data-based decision making) problems, the decision, a high-dimensional function of data, can be reduced to a single-dimensional function of a sufficient analytic statistic. Furthermore, the data uncertainty often causes a decision maker to be less confident and thus significantly lowers the decision.

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Sunday, 02:45 PM - 04:15 PM, Piscataway — Track: Energy Supply Chains

Invited Session: Energy Supply Chain Management

Chair(s): Alexandar Angelus

093-0928 The Role of Natural Gas Infrastructure in North American Energy Resiliency

Charalampos Avraam, Student, Johns Hopkins University, United States
Sauleh Siddiqui, Assistant Professor, Johns Hopkins University, United States
Adrian Au, Student, Johns Hopkins University, United States

Natural Gas is the main fuel for electricity production and industrial activities in North America. Its significance, coupled with recent regional supply disruptions affecting its availability, raises resiliency concerns for stakeholders of major fuel-intensive industries. This presentation investigates the role of natural gas infrastructure in North American energy resiliency.

093-1086 Pathwise Optimization for Merchant Energy Production

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

Merchant management of energy production yields an intractable Markov decision process. Well-known least squares Monte Carlo methods lead to policies that exhibit large optimality gaps on realistic instances. We narrow this gap and obtain improved policies by extending pathwise optimization and solving the resulting formulation using preconditioning and decomposition methods

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093-1416 Capacity Investment Under Technology Readiness Level Based Bayesian Information Updates: An Application to DOE R&D

Aditya Vedantam, Assistant Professor, State University of New York at Buffalo, United States
Ananth Iyer, Professor, Purdue University, United States

Research and development (R&D) projects at the Department of Energy (DOE) use Technology Readiness Level (TRL)-based classification of project maturity to track technology progress towards commercialization. In this paper, we capture the impact of TRL-based Bayesian information updates from R&D projects on capacity investment decisions as an industrial partner.

093-1462 Upgrades and Refurbishment of Power Plants in the Presence of Limited Long-Term Information

Andreas Kleiven, Student, Norwegian University of Science And Technology, Norway
Selva Nadarajah, Assistant Professor, University of Illinois at Chicago, United States
Stein-Erik Fleten, Professor, Norwegian University of Science And Technology, Norway
Danial Mohseni Taheri, Student, University of Illinois at Chicago, United States
Hans Ole Riddervold, Student, Norwegian University of Science And Technology, Norway

Upgrading and refurbishment of power plants is a long-term planning problem affected by operations and multiple uncertainties including prices, weather and plant condition. We study the impact of model mis-specification in long-term planning.

093-1102 Distributed Renewable Power Generation and Implications for Capacity Investment, Electricity Prices, and Sustainability

Alexandar Angelus, Assistant Professor, Mays School of Business, United States

In our continuous-time model, a consumer can dynamically delay his investment in distributed renewable generation to minimize his electricity cost. We establish the consumer's optimal timing and capacity for this investment, and the revenue-maximizing price for his electric utility. We introduce a method to value the resulting carbon emissions reduction.

458

Sunday, 02:45 PM - 04:15 PM, Oak Lawn — Track: Marketing and Operations Management

Invited Session: Emerging Models in Marketing and Operations Management

Chair(s): Ruixia Shi

093-0266 The Impact of Quality Perception and Consumer Valuation Change on Manufacturer’s Optimal Strategies

Kunpeng Li, Assistant Professor, California State University Northridge, United States
Lan Wang, Assistant Professor, California State University East Bay, United States
Dilip Chhajed, Professor, University of Illinois Urbana-Champaign, United States
Suman Mallik, Associate Professor, University of Kansas, United States

We consider a manufacturer who produces and sells a new product. The product quality is unobservable to consumers before purchase. We formulate a two-period model to analyze the impact of consumer quality perception and consumer valuation change on manufacturer’s optimal decisions over quality, warranty, price, and market coverage strategies.

093-0980 Product Bundling in Distribution Channels Under Fairness Concerns

Xiang Ji, Student, School of Management, University of Science and Technology of China, China

We study firms' optimal decisions on product bundling in a bilateral monopoly distribution channel. We show how manufacturer-driven bundling and retailer-driven bundling are respectively influenced by the joint effect of channel decentralization and fairness concerns.

093-1551 Optimizing Starvation to Avoid Cannibalization: Retailer's Strategies for Markets in Crisis

Sandun Perera, Assistant Professor, University of Michigan-Flint, United States
Metin Cakanyildirim, Professor, University of Texas Dallas, United States
Syagnik Banerjee, Associate Professor, University of Michigan-Flint, United States

At times of crisis and disaster, donors often pay for necessary commodities distributed via local retailers. Retailers need to set prices that balance the tradeoffs between vulnerable customer needs and their ability to pay. We study this pricing problem under different market conditions.

093-1851 Efficiency Loss of Competition and Revenue Sharing Contracts in Express Service Industry

Hongyu Chen, Associate Professor, CSU Long Beach, United States
Yihong Hu, Assistant Professor, Tongji University, China
Suresh Sethi, Professor, University of Texas Dallas, United States

We use a three-tier model to analyze express service competition and the retailer's optimal behavior. We establish upper and lower bounds of efficiency loss in express service industry with congestion effect and identify the key performance indicators. Our results provide insights into express delivery service in the online shopping industry.

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Sunday, 02:45 PM - 04:15 PM, Northwest Track: Social Media and Internet of Things

Invited Session: Social Media and Healthcare

Chair(s): Wenjing Duan

093-1034 Quality Spillovers and Information Spillovers from Insurance Companies to Hospitals

Nirup Menon, Professor, School of Business, United States

To better understand the network-level factors that affect the quality of patient care outcomes of hospitals, information and quality spillovers from efforts made by insurance companies are differentiated and hypothesized to impact hospital quality. Empirical validation is conducted using panel data.

093-1076 Does Money Talk? Evidence from a P2P Car Sharing Platform

Yixin Lu, Assistant Professor, George Washington University, United States

We examine the effect of monetary incentives on user onboarding. Using a randomized field experiment at a P2P car sharing platform, we find that contrary to the conventional view, monetary incentive is ineffective in motivating users to disclose their personal information in the initial onboarding stage.

093-1884 You Run, I Donate: Shared Social Responsibility Through a Distance Tracker Mobile Application

Xue Tan, Assistant Professor, Indiana University Bloomington, United States
Lu (Lucy) Yan, Assistant Professor, Indiana University Bloomington, United States
Alfonso Pedraza-Martinez, Associate Professor, Indiana University, United States

Instead of sponsoring a cause or charity directly, companies can sponsor individual pro-social behavior tracked by mobile applications to support these causes. This study aims to study the distinct firm value of such corporate sponsorship in the context of a distance tracker mobile application that supports such sponsorship.

093-1032 An Investigation of User Engagement and Doctor-Seeking Decision in an Online Health Infomediary

Dobin Yim, Assistant Professor, Fordham University, United States
Sanghee Lim, Assistant Professor, Johns Hopkins University, United States
Jiban Khuntia, Assistant Professor, University of Colorado Denver, United States
Wenjing Duan, Associate Professor, George Washington University, United States

In this study, we argue and investigate how interactions of different patient activities in a health infomediary influence the doctor-seeking decision. Data from 39,000 users' activities from an online reconstructive surgery-focused health infomediary was used for empirical analysis.

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Sunday, 02:45 PM - 04:15 PM, Morgan Track: Public Sector Operations Management

Invited Session: Emergency Response Operations Management in Health Care

Chair(s): Nan Kong

093-0883 Improving Patient Transfer Protocols for Regional Stroke Networks

Beste Kucukyazici, Assistant Professor, Mcgill University, Canada
Amir Ardestani Jaafari, Post Doc/Researcher, Mcgill University, Canada

We develop an analytical framework to enrich stroke routing decisions that incorporates spatial variation in population density, time and severity of stroke, and congestion levels at the hospitals. We develop predictive models to estimate outcomes associated with given stroke-network and optimize patient allocations under stochastic demand and congestion-dependent service time.

093-1003 Optimizing the Trauma-Care Network Design by a Bi-Level Optimization Method

Mingzheng Wang, Professor, Zhejiang University, China
Shaonan Liu, Student, Dalian University of Technology, China
Nan Kong, Associate Professor, Purdue University, United States
Pratik Parikh, Associate Professor, Wright State University, United States

This paper studies a subsidized trauma-care network redesign problem which contains two decision-makers: the government and hospital system, based on real data. We present a bi-level optimization model and propose an exact algorithm for it. Finally, some management insights for the trauma-care network design are given.

093-1279 Predictive Optimization for Cholera Outbreak Control with PoC Testing Sensor Routing

Mu Du, Post Doc/Researcher, School of Economics and Management, Southeast University, China
Nan Kong, Associate Professor, Purdue University, United States
Lindu Zhao, Professor, Southeast University, Nanjing, China, China

We consider a cholera outbreak control optimization problem with parts of system state information pertaining to disease spread obtained by Point-of-Care (PoC) testing sensors. We propose a predictive optimization framework concerning the operations and costs of mobile sensor routing. We conduct numerical studies to show the necessity of routing consideration.

093-1738 Response Time Optimization for Drone-Delivered Automated External Defibrillators

Justin Boutilier, Post Doc/Researcher, Massachusetts Institute of Technology, United States
Timothy Chan, Associate Professor, University of Toronto, Canada

In this paper, we propose a framework to optimize the deployment of drone-delivered automated external defibrillators that accounts for system congestion and current 911 response times. We demonstrate the application of our framework using eight years of real data from a large region covering 10,000 square miles around Toronto, Canada.

093-1078 Conic Formulations of Queuing-Based Drone Network Delivery Models

Janiele Custodio, Student, The George Washington University, United States
Miguel Lejeune, Associate Professor, George Washington University, United States

Drones are emerging technologies with a wide range of applications. One potential use is to reduce the delivery time of automated external defibrillators (AEDs) to cardiac arrest occurrences in remote areas. This research presents second-order cone programming reformulations of queuing-based optimization models for drone network delivery of AEDs.

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Sunday, 02:45 PM - 04:15 PM, Jay Track: Emerging Topics in Operations Management

Invited Session: Operations across Platforms & Ecosystems

Chair(s): Mahour Parast

093-2288 The Gig Economy: Investigation of Implications for Matching Supply with Demand

Amrou Awaysheh, Assistant Professor, Indiana University, United States
Markham Frohlich, Associate Professor, Indiana University Indianapolis, United States
Barbara Flynn, Professor, Indiana University, United States

The gig economy, which is comprised of non-permanent employees (example: Uber), presents particular challenges for matching supply with demand. We study logistics services gigs by owner-operators vs company drivers, applying agency theory to derive hypotheses related to load pickup timeliness, using a very large archival dataset.

093-1589 Service Variety in Competitive Service-Sharing

Jie Wu, Professor, University of Science and Technology of China, China
Wei Lu, Student, University of Science and Technology of China, China
Xiang Ji, Student, University of Science and Technology of China, China

The opposite observations in ride-sharing and online food delivery in China make it questionable as to whether a service-sharing platform, facing intense competition, should adjust service variety similar to its rival or not. We show that core differentiation of service plays a critical role in driving uniform service variety in competition

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093-1334 Capacity Decisions in an e-Hailing Platform

Arulanantha Prabu Ponnachiyur Maruthasalam, Student, Indian Institute of Management Ahmedabad, India
Asoo Vakharia, Professor, University of Florida, United States
Debjit Roy, Associate Professor, Indian Institute of Management Ahmedabad, India
Prahalad Venkateshan, Associate Professor, Indian Institute of Management Ahmedabad, India

An e-hailing platform faces both supply (e.g., number of enrolled drivers, ride refusals, and absenteeism) and demand (e.g., rides requested) uncertainty. We provide insights for how to best manage capacity in both constrained and unconstrained supply settings in order to meet uncertain demand.

093-1372 An Examination of a Relationship Among Network Structure, Disruptions, and Innovation: Empirical Evidence from United Airlines

Mansoor Shekarian, Student, North Carolina A&T State University, United States
Mahour Parast, Assistant Professor, North Carolina A&T State University, United States

We present an empirical analysis on the relationship between network structure, service disruptions, and innovation. We examine whether the network structure is related to operational and financial performance of the firm.

093-2321 Measurement of the Impacts of Technology Innovations to Productivity

Edit Sule, Professor, Szechenyi Istvan University, Hungary

The application of innovative technologies in the operation of industrial companies aims to achieve imprevement in productivity. Nevertheless, the impacts of new solutions cannot be followed by the productivity indicators. While there are methodological problems concerning the measurement of productivity, innovations add new challenges to measure the change caused.

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Sunday, 02:45 PM - 04:15 PM, Holmead East Track: Global Supply Chain Management

Invited Session: Data and Information in Supply Chain Management

Chair(s): Kefeng Xu

093-1016 Ethical Decision-Making Over Time

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

We investigate ethical decision-making and examine the dynamics between consecutive decisions that invoke ethical considerations in supply management. Instead of focusing on individual instances of ethical decision-making, we investigate an individual's ethical decision-making behaviors in the long term (10 decisions over 10 weeks) via a stochastic process methodology.

093-1099 The Implications of a Buyer-Supplier Relationship for Improving Factory Working Conditions in Developing Countries

Xiaojin Liu, Assistant Professor, Virginia Commonwealth University, United States
Anant Mishra, Associate Professor, University of Minnesota, United States

What are the implications of a buyer-supplier relationship for improving factory working conditions in developing economies? We investigate the research question using archival data from safety inspection reports and the following correction progress reports on supplier factories in Bangladesh.

093-1112 Sharing Forecasts with a Common Retailer Under Competition

Aditya Jain, Assistant Professor, Baruch College, United States

We consider two manufacturers' decision to share private demand information with a common retailer. Our results highlight that manufacturers may use information as a way of softening competition and earning higher profits.

093-1506 Sustainability, Emissions, and Emerging Market Presence of Global Firms

Yan Dong, Professor, University of South Carolina, United States
Manoj Malhotra, Professor, Case Western Reserve University, United States
Deepa Wani, Assistant Professor, University of Texas at San Antonio, United States
Kefeng Xu, Professor, University of Texas at San Antonio, United States

Global firms strategically enter emerging markets to take advantage of market and sourcing opportunities, but also lose environment regulations and weak protection of existing laws there. This research empirically investigates the relationship between a firm's presence in emerging markets and its emission levels, as impacted by firms' various sustainability efforts.

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Sunday, 02:45 PM - 04:15 PM, Holmead West Track: Retail Operations

Invited Session: Digital transformation in retailing

Chair(s): Necati Ertekin Mehmet Gumus

093-0307 Shared Services: Pricing Strategy and Its Implications

Han Zhu, Student, Mcgill University, Canada
Mehmet Gumus, Associate Professor, Mcgill University, Canada
Saibal Ray, Professor, Mcgill University, Canada

House sharing platforms are evolving from a peer-to-peer market to a new market where commercial operators are playing more and more important roles. The dominant pricing strategy on the platform is also changing. Our primary goal is to understand the implications of this change in pricing strategy for all stakeholders.

093-0320 Revenue Management Through Personalized Website Displays and Fulfillment

Yanzhe Lei, Assistant Professor, Queen's University, Canada
Stefanus Jasin, Associate Professor, University of Michigan, United States
Andrew Vakhutinsky, Principal Scientist, Oracle, United States
Joline Uichanco, Assistant Professor, University of Michigan, United States

E-tailers have the capability to show personalized website displays (ranking and prices of products) to each customer. We demonstrate how e-tailers can maximize revenues by constructing personalized displays based on customer characteristics and the state of inventory in the network. This work is a collaboration with Oracle Retail.

093-1493 On Rational Inattention and Product Variety

Tugce Vural, Student, Penn State University University Park, United States
Aydin Alptekinoglu, Associate Professor, Penn State University University Park, United States

We develop a choice model based on the theory of rational inattention and apply it to two different retail formats: traditional brick-and-mortar stores and online stores with curated assortments. By comparing the two formats, we study the economics of online retailers providing curation to help rationally inattentive shoppers choose.

465

Sunday, 02:45 PM - 04:15 PM, Gunston East Track: Purchasing and Supplier Management

Invited Session: Supply uncertainty, supplier reliability and quantity discounts

Chair(s): Charles Munson

093-0104 Developing a Supply Chain Stress Test

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

Using predictive global sensitivity analysis, we develop a single predictive structural equation that managers can use to "stress test" the ability of a given supply chain to deal with crises under extreme, but plausible, scenarios. The single structural equation allows managers to re-evaluate the chain promptly as conditions change.

093-0401 Balance Electricity Supply in Smart Grid with Machine Learning

YU AMY XIA, Associate Professor, College of William and Mary, United States

Through machine learning, this research aims to predict electricity supply outrages caused by uncertain supply of the supplier-consumer systems, many consisting of roof-top solar panels and remote wind turbines . We also exam various schemes to control and balance the electricity supply of a smart grid.

093-1768 Common Replenishment Cycle Order Policies for Multiple Products with Capacity Expansion Opportunities and Quantity Discounts

Jonathan Jackson, Assistant Professor, Providence College, United States
Charles Munson, Professor, Washington State University Pullman, United States

We develop efficient solutions for a constrained, multi-product lot-sizing problem with a common replenishment cycle, all-units quantity discounts, and a flexible common resource capacity. To improve the cost effectiveness of the traditional common replenishment cycle approach, we introduce a refinement policy that increases flexibility in the lot sizing decisions.

093-2118 Supplier Selection and Returns Policy in the Presence of Customer Returns

Jing Chen, Professor, Dalhousie University, Canada
Bintong Chen, Professor, University of Delaware, United States

Two suppliers supply a well-known and new brand products respectively to a retailer who faces customer returns. We identify the conditions under which the retailer should choose one or both manufacturers. We discuss the retailer's optimal returns policies and their impacts on prices, demands and profits in supply chain.

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Sunday, 02:45 PM - 04:15 PM, Gunston West Track: Next Generation Operations

Invited Session: Healthcare Operations

Chair(s): Lauren Lu

093-0435 Optimizing Bed Allocation and Utilization in Nursing Homes

Yangzi Jiang, Student, Northwestern University Kellogg School o, United States
Lauren Lu, Associate Professor, University of North Carolina Chapel Hill, United States
Jan Van Mieghem, Professor, Northwestern University, United States

Nursing homes serve two types of residents: (1) Medicare-covered residents with high daily reimbursement, but short length of stay (LOS); (2) Medicaid-covered residents with low daily reimbursement, but long LOS. Our paper proposes a queueing model that determines the optimal bed allocation policy to maximize revenue and minimize waiting time.

093-1679 Impact of Healthcare Information Technology on Heart Attack Patients' Interhospital Transfer

Yao Li, Student, Tsinghua University, China
Lauren Lu, Associate Professor, University of North Carolina Chapel Hill, United States
Feng (Susan) Lu, Associate Professor, Purdue University, United States
Jian Chen, Professor, Tsinghua University, China

Using 2007-2013 New York State Emergency Department and Inpatient Databases and HIMSS Database, we investigate the impact of health information technology's (HIT) adoption on the treatment of heart attack patients who need interhospital transfer. We adopt the patient in-hosptial death and readmission as treatment measurement.

093-0206 Does Ownership Conversion from Nonprofit to For-Profit Benefit the Public?

Lauren Lu, Associate Professor, University of North Carolina Chapel Hill, United States
Feng (Susan) Lu, Associate Professor, Purdue University, United States

In the last few decades, many healthcare institutions converted their ownership from nonprofit to for-profit. Employing a large panel dataset of U.S. nursing homes dated from 2006 to 2015, we conduct a difference-in-differences analysis on converting facilities' financial performance, operating policies, and service quality.

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Sunday, 02:45 PM - 04:15 PM, Fairchild East Track: POM in Practice

Invited Session: Sharing Economy: Matching and Competition

Chair(s): Shihong Xiao

093-0436 Dynamic Type Matching

Ming Hu, Professor, University of Toronto, Canada
Yun Zhou, Assistant Professor, Mcmaster University, Canada

We study a centralized dynamic matching problem between various types of demand and supply. We propose a condition on the matching rewards under which the optimal matching policy has a priority structure. We also compare the centralized system with the decentralized one in a simplified setting.

093-1830 Competition Between Two-Sided Platforms Under Demand and Supply Congestion Effects

Fernando Bernstein, Professor, Duke University Durham, United States
Gregory Decroix, Associate Professor, University of Wisconsin-Madison, United States
N. Bora Keskin , Assistant Professor, Duke University Durham, United States

We explore the impact of competition between ride-sharing platforms. Customers' and drivers' utilities are sensitive to prices and congestion. We consider two scenarios, one in which each driver works exclusively for a single platform ("single-homing") and another scenario in which drivers may work for both platforms ("multi-homing" or "multi-apping").

093-2098 Should a Matching Platform Pay Its Users to Leave?

Tinglong Dai, Associate Professor, Johns Hopkins University, United States
Ozge Sahin, Associate Professor, Johns Hopkins University, United States
Christopher Tang, Professor, University of California Los Angeles, United States

A matching platform affords members with opportunities to meet and form relationships with each other. We consider a type of matching environment in which members value the composition of their potential partners. We find a refund scheme can help the platform improve user surplus, platform revenue, and social welfare.

093-1945 Competition in Ride-Sharing Markets

Shihong Xiao, Post Doc/Researcher, University of Minnesota, United States

Yang Xiaotang, Student, University of Minnesota, United States
Saif Benjaafar, Professor, University of Minnesota, United States

We study two-sided competition between two firms in ride-sharing markets where duopoly firms set price and wage rate to compete on both customers and drivers. By comparing monopoly and duopoly equilibria, we investigate how competition impacts wage rate, labor welfare, consumer welfare, and firms' surplus.

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Sunday, 02:45 PM - 04:15 PM, Fairchild West Track: Socially Responsible Operations

Invited Session: Topics in Socially Responsible Operations

Chair(s): Natalie (Ximin) Huang Wayne Fu

093-0542 Firm Innovation and Extended Producer Responsibility Implementation

Yuqi Peng, Student, University of South Carolina, United States
Yan Dong, Associate Professor, University of South Carolina, United States
Sining Song, Assistant Professor, University of Tennessee Knoxville, United States

With the increasing public consciousness of product recycling and waste management, various types of EPR related legislation are changing firms' decisions. We empirically test the relationship between EPR implementation and the firm's operations and innovation.

093-0630 The Effect of CSR Reporting on Firm Performance: An Empirical Investigation

Zhasmina Tacheva, Student, Suny At Buffalo, United States
Natalie Simpson, Associate Professor, Suny At Buffalo, United States

By applying machine learning techniques for classification and topic modeling to the CSR reports of U.S. public companies, this study seeks to develop firm-level measures of corporate governance and assess their ability to predict firm performance.

093-0896 Risky Business: Interview Evidence on Supply Chain Uncertainty from 60 Senegalese Firms

Mark Brennan, Student, Massachusetts Institute of Technology, United States
Jonars Spielberg, Student, Massachusetts Institute of Technology, United States
Stephen Graves, Professor, Massachusetts Institute of Technology, United States
Bishwapriya Sanyal, Professor, Massachusetts Institute of Technology, United States

What risks does a small African firm face? We conduct interviews with all vendors of irrigation materials in Senegal's two irrigated zones about their supply chain risks and coping strategies. Their risks are similar to those risks documented in developed economies, though their coping strategies are often informal or constrained.

093-0885 The Prioritization of Environmental Issues in the Consumer Products Industry

Wayne Fu, Assistant Professor, University of Michigan Dearborn, United States
Jack C. P. Su, Assistant Professor, University of New Mexico, United States

Focusing on the consumer products industry, we explore firms' prioritization pertaining to environmental issues including water usage, waste management, energy consumption, and greenhouse gas emissions . We then examine the implications of such prioritization on firms' perceived risk and financial performance.

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Sunday, 02:45 PM - 04:15 PM, Du Pont Track: Revenue Management and Pricing

Invited Session: Pricing in Revenue Management (1)

Chair(s): Guang Li

093-0371 Real-Time Dynamic Pricing for Revenue Management with Reusable Resources with Deterministic Service Time Requirements

Yanzhe Lei, Assistant Professor, Queen's University, Canada
Stefanus Jasin, Associate Professor, University of Michigan, United States

We study a dynamic pricing problem where a firm uses a finite amount of resources to serve price-sensitive customers arriving randomly over time under deterministic service time assumption. We develop real-time pricing controls and show that they are asymptotically optimal.

093-1290 Optimal Bayesian Price Fine-Tuning

Jue Wang, Assistant Professor, Queen's University, Canada

We study the optimal Bayesian pricing policy for a linear demand model with unknown price sensitivity. We characterize the structure of the optimal policy using a novel technique based on Gauss transform and develop efficient algorithm for computing the exact optimal policy.

093-1538 Price Optimization Under an N-Pack Choice Model

Ying Cao, Assistant Professor, Penn State University Erie, United States
Guang Li, Assistant Professor, Queen's University, Canada

We consider the price optimization problem for a retailer who faces multiple-item purchasing customers. Given an assortment, the retailer aims at maximizing their total expected revenue by setting prices for each product. We study the structural properties of the optimal prices under different pricing schemes and develop efficient algorithms.

093-0736 Joint Assortment-Price-Position Optimization Under the Exponomial Choice Model

Jingcheng Xu, Student, Tsinghua University, China
Rui Chen, Student, Tsinghua University, China
Hai Jiang, Associate Professor, Tsinghua University, China

We study the joint assortment-price-position optimization problem under the exponomial choice model. The goal is to determine the revenue-maximizing subset of products with their corresponding selling prices and display positions. We formulate this problem as a non-linear mixed integer program and propose an exact algorithm to obtain the optimal solution.

471

Sunday, 02:45 PM - 04:15 PM, Cardozo — Track: Data Science

Contributed Session: Machine Learning Applications

Chair(s): Lu Peng

093-0020 An Evidential Reasoning Approach in Modelling of Passenger Value Based on Machine Learning

Sien Chen, Student, Manchester Business School, China

Based on the dataset of 327 passenger portraits, the paper uses logical regression, GBDT, and neural network to predict the passengers' value score, then, fusing the three results by hard voting and Evidential Reasoning modelling. The results indicate that Evidential Reasoning is more advantageous than the others.

093-0719 A Modelling-Oriented Review on Supply Chain Finance: A Machine Learning Based Thematic Analysis

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

Supply Chain Finance (SCF) has attracted increasing attention in recent years. This study adopts a systematic literature review methodology for over 200 modelling based SCF papers. Based on a machine learning enabled thematic analysis, a conceptual framework is developed and promising directions for SCF research are recommended.

093-0419 Long Short-Term Memory with Random Forest for Tourist Arrivals' Forecasting Using Search Query Data

Lu Peng, Student, Huazhong University of Science & Technology, China
Lin Wang, Professor, Huazhong University of Science & Technology, China

Nowadays, people usually obtain travel information through search engines before traveling. Long short-term memory with random forest, called RF-LSTM, is proposed for tourist arrivals' forecasting. RF is used to reduce the dimensionality of Google Trends. LSTM is a prediction method. The example indicates that RF-LSTM outperforms some popular forecasting models.

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Sunday, 02:45 PM - 04:15 PM, Coats — Track: Manufacturing Operations

Contributed Session: Quality Management Practices

Chair(s): Fang Li

093-1755 What Makes Product-Defects Toxic? Investigating the Impact of Product Defects on Quality Perceptions and Repurchase-Behavior

Marcel Paulssen, Professor, University of Geneva, Switzerland
Ramesh Roshan Das Guru, Student, University of Geneva, Switzerland

In a longitudinal-study of US customers, we investigate how experiencing product-defect damages the customer's perception of product-quality and ultimately their repurchase behavior and determinants thereof. As moderating factors perceived-severity, warranty-coverage, and attributions (responsibility and stability), recovery-efforts as well as the identity relevance of the product defect are also investigated and validated.

093-2008 Quality Management Practices in Vietnamese and Japanese Manufacturing Plants

Minh Nguyen, Student, University of Economics Ho Chi Minh City, Japan
Anh Nguyen, Student, Yokohama National University, Japan
Anh Phan, Lecturer, VNU - University of Economics and Business, Hanoi, Vietnam
Yoshiki Matsui, Professor, Yokohama National University, Japan

This study examines and compares the impact of quality management practices on operational performance between Vietnamese and Japanese plants. Based on 47 responses collected in 2015, empirical results indicate significant differences in critical quality management practices contributing to operational capabilities in the two countries.

093-2000 Design for Quality and Customer Satisfaction: The Role of Quality Information Practices

Anh Nguyen, Student, Yokohama National University, Japan
Minh Nguyen, Post Doc/Researcher, Yokohama National University, Japan
Anh Phan, Associate Professor, University of Economics and Business, Vietnam
Yoshiki Matsui, Professor, Yokohama National University, Japan

This study investigates whether quality information practices in the design for quality contribute to improvement of customer satisfaction in manufacturing plants. Significant relationships between design for quality and customer satisfaction has been empirically found based on a global dataset from the 4th round of the High-Performance Manufacturing (HPM) project.

093-0780 Are Multiple Quality Standards Better Quality Signals? Evidence from the Automobile Industry

Fang Li, Student, I E S E, Spain
Yiyi Fan, Student, Lancaster University, United Kingdom

Using a secondary dataset, this study investigates the effects of single and multiple quality standards on quality performance in the automobile industry. The literature on quality standards (e.g., ISO 9001) offers mixed results regarding the performance implications. The results have implications on the effectiveness of using certifications as quality signals.

473

Sunday, 02:45 PM - 04:15 PM, Columbia 1 Track: Scheduling and Logistics

Contributed Session: Vehicle Routing & Related Problems (I)

Chair(s): MINGYAO QI

093-1717 Hybrid Branch-and-Cut for the Multi-Vehicle Inventory Routing Problem

Panagiotis Repoussis, Assistant Professor, Stevens Institute of Technology, United States
Eleftherios Manousakis, Student, Athens University of Economics and Business, Greece
Christos Tarantilis, Professor, Athens University of Economics and Business, Greece

This paper examines the multi-vehicle inventory routing problem with maximal level policy. A two-commodity flow formulation is proposed together with various valid inequalities. A branch-and-cut scheme is adopted that employs local search algorithms for separating various classes of cuts. New upper and lower bounds are reported for well-know benchmark instances.

093-2012 The Consistent Pickup and Delivery Problem

David Bergman, Assistant Professor, University of Connecticut, United States
Robert Day, Associate Professor, University of Connecticut, United States
Mohsen Emadikhiav, Student, University of Connecticut, United States

We introduce a new variant of simultaneous pickup-and-delivery problems where customer visits need to be consistently scheduled over the planning horizon. The problem incorporates challenging routing, scheduling, and allocation decisions. We present mixed-integer programming formulations and exact algorithms to solve the problem.

093-0439 Order Picking in Mobile Robotic DCs: A Traveling Salesman Problem Where Nodes Traverse Edges

Nima Zaerpour, Assistant Professor, California State University San Marcos, United States

Mobile robotic fulfillment centers, such as Amazon Robotics, are becoming popular. In such systems, the main questions are (1) in which sequence the storage pods are retrieved, and (2) where to store back the pods. In this paper, the problem is represented as a variant of Traveling Salesman Problem.

093-2369 Scheduling of Robotic Mobile Fulfillment System in Puzzle-Based Storage Warehouses

MINGYAO QI, Associate Professor, Tsinghua University, China
Xiaowen Li, Student, Tsinghua University, Graduate School at Shenzhen, China

This study investigates the scheduling of the order picking system with parts-to-picker robots, specifically, in high-density puzzle-based storage systems. We present the modeling of the three decoupled subsystems: task assignment system, routing system, and coordination systems. Simulation experiments are designed to reveal managerial insights for capacity-sensitive applications.

474

Sunday, 02:45 PM - 04:15 PM, Columbia 2 Track: Operational Excellence

Invited Session: Industry 4.0 & Big Data

Chair(s): Guilherme Tortorella

093-1791 Operational Excellence in Industrial Additive Manufacturing Systems

Daniel Eyers, Lecturer, Cardiff University, United Kingdom
Mia Delić, Lecturer, University of Zagreb, Croatia

Additive Manufacturing (3D Printing) is one of the key digital manufacturing technologies that underpins the Industry 4.0 concept, yet its effective integration and management continues to elude many adopters. This paper highlights the main opportunities and challenges arising from the application of Operational Excellence principles for Industrial Additive Manufacturing Systems.

093-1809 Satellite Bigdata Analytics Based Agri-Insurance Claim Settlement

Narayan Nagendra, Student, Friedrich-Alexander Universitat Erlangen-Nurnberg, Germany
Gopalakrishnan Narayanamurthy, Lecturer, University of Liverpool, United Kingdom
Roger Moser, Assistant Professor, University of St. Gallen, Switzerland

In this paper, we present a case study on how satellite bigdata analytics deployed in the Northern Indian district of Bhiwani has addressed the inefficiencies in the agri-insurance claim settlement process. The results showcase how transparency brought in by the satellite bigdata analytics curbs the plausible exploitation of insurance claims.

093-1220 Prediction of Collaborative Performance Management Systems

Simon Okwir, Assistant Professor, Stockholm Business School, Sweden

The purpose of this paper is to predict factors that affect collaborative measures. Through a sample of 2,100 flight movements, an Artificial Neural Network (ANN) is developed that identifies features causing bottlenecks in airport operations with many actors.

093-0132 Lean Production and Industry 4.0: A Comparative Study Between Developing and Developed Economies

Guilherme Tortorella, Assistant Professor, Universidade Federal De Santa Catarina, Brazil
Matteo Rossini, Post Doc/Researcher, Politecnico Di Milano, Italy
Federica Costa, Post Doc/Researcher, Politecnico Di Milano, Italy
Alberto Staudacher, Professor, Politecnico Di Milano, Italy

This research examines the differences in Lean Production implementation and Industry 4.0 adoption between developing (Brazil) and developed economies (Europe). A survey was carried out with 249 manufacturers and preliminary results indicate that the socio-economic context does matter for implementing both approaches, although its influence is not always as expected.

475

Sunday, 02:45 PM - 04:15 PM, Columbia 3 Track: Next Generation Operations

Invited Session: Blockchain Supply Chain Applications

Chair(s): Hubert Pun

093-0062 Should Blockchain Databases Be Used to Manage Supply Chains

F. Robert Jacobs, Emeritus Professor, Indiana University Bloomington, United States

Supply Chain Management is driven by planning and communication, and rely on database technology for information storage. Traditional systems use efficient central database systems. In this paper, we discuss the trade-offs associated with using blockchains rather than the conventional approach. Issues related to scalability, security, and accuracy are discussed.

093-0418 Blockchain Technology (BT) Enabled Traceability Solutions in Agricultural Supply Chains

Rohit Sharma, Student, National Instituteof Industrial Engineering, Mumbai, India

BT has led to a disruption in the supply chain by eliminating the trust related issues. BT will bring a paradigm shift and leverage the ASCs. Relationships among BT enablers are identified and established. The findings from the study highlight traceability as the significant reason for implementing BT in ASCs.

093-1429 Exploring Supply Chain Managers' Perceptions About Blockchain

Janet Hartley, Professor, Bowling Green State University, United States
William Sawaya, Associate Professor, Bowling Green State University, United States
David Dobrzykowski, Associate Professor, Bowling Green State University, United States

Despite growing interest in Blockchain technology for supply chain applications, few organizations are using blockchain. Using an experiment, we explore the perceptions that supply chain management professionals have about blockchain. Situations in which blockchain is most likely to be adopted are explored.

093-1994 Blockchains, Information Asymmetry and Efficiency in Healthcare Supply Chains

Gurpreet Dhillon, Professor, University of North Carolina Greensboro, United States
Kane Smith, Assistant Professor, University of North Carolina Greensboro, United States
Vashkar Ghosh, Assistant Professor, University of North Carolina Greensboro, United States

The healthcare industry must comply with regulations and protocols which hinders efficient information sharing. This study investigates how blockchain can efficiently reduce information asymmetry and increase efficiency in the healthcare domain. We provide a theoretical framework on how blockchain can alleviate some of the existing issues.

476

Sunday, 02:45 PM - 04:15 PM, Columbia 4 Track: Healthcare Analytics

Contributed Session: Healthcare Resource Allocation

Chair(s): Keivan Sadeghzadeh

093-1986 Managing Medical Supplies – A Critical Examination of In-Stock vs Consignment Stock Policies

Anand Nair, Professor, Michigan State University, United States
Claudia Rosales, Assistant Professor, Michigan State University, United States
Sukrit Pal, Student, Michigan State University, United States

Hospitals use consignment inventory as a common way to reduce the high expenses associated with purchasing and managing medical supplies. Despite what hospital managers expect, we find that the use of consignment inventory may result in increased inventory costs, particularly for the most expensive type of supplies, physician preferred items.

093-0869 Should Everybody Be Screened for Diabetes in the Emergency Department?

M Gabriela Sava, Assistant Professor, Clemson University, United States
Ronald Pirrallo, Vice-Chair for Academic Affairs Department of Emergency Medicine , Greenville Health System, United States
Jerrold May, Professor, University of Pittsburgh, United States
JINGYUAN TIAN, Student, Clemson University, United States

Diabetic screening of ED patients can proactively improve health outcomes, but it is uneconomical to screen all such patients. We present a modeling approach for identifying patients who have a negligible risk of diabetes, so that available resources can be used to screen those with a non-negligible risk.

093-2168 The Patterns and Proximity to Psychiatric Inpatient Healthcare Services by Level of Socioeconomic Disadvantage

Joohyun Chung, Assistant Professor, University of Massachusetts Dartmouth, United States
Keivan Sadeghzadeh, Assistant Professor, University of Massachusetts Dartmouth, United States
Soheil Sibdari, Associate Professor, University of Massachusetts Dartmouth, United States

Although psychiatric hospitalization has proven to be indispensable, to prevent suicides and to help individuals in need, a controversial issue is the more of a socioeconomic stigmatizing act than a therapeutic act. We address the association between socioeconomic status to the patterns and proximity to psychiatric inpatient healthcare services.

477

Sunday, 02:45 PM - 04:15 PM, Columbia 5 Track: Healthcare Operations Management

Invited Session: Inpatient Management

Chair(s): Jingui Xie Zhichao Zheng

093-1012 Prioritization Between Boarding Patients and Patients Currently Under Treatment in the Emergency Department

Kim De Boeck, Student, Katholieke Universiteit Leuven, Belgium

Raisa Carmen, Post Doc/Researcher, Katholieke Universiteit Leuven, Belgium
Nico Vandaele, Professor, KU Leuven, Belgium

Boarding patients and the extra workload they introduce are a major concern in emergency departments. The main contribution of this paper is the examination of different priority policies for the physicians when needy boarding patients are added to the analysis.

093-2353 Impact of Geographical Proximity of a Hospital Within a Healthcare Network on its Cost Performance

Ashok Balakrishnan, Student, Michigan State University, United States
Anand Nair, Professor, Michigan State University, United States

We examine how the average distance of a hospital, affiliated to a healthcare network, from the rest of the hospitals within the network impacts its cost performance, and how quality of a hospital can affect this impact. The study focuses on short-term acute care, critical access, and long-term acute care hospitals.

093-1759 Optimal Stopping for Medical Treatment with Forecast Information

Guang Cheng, Student, University of Science and Technology of China, China
Jingui Xie, Associate Professor, University of Science and Technology of China, China
Zhichao Zheng, Assistant Professor, Singapore Management University, Singapore

We develop discrete-time finite horizon (partially observable) Markov decision process models incorporating (imperfect) forecast information to support medical treatment continuation decisions. We characterize the structure of the optimal policies and show that knowing even moderately accurate forecast information can lead to more personalized policies and significantly improved medical outcomes.

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478 Sunday, 02:45 PM - 04:15 PM, Columbia 6 Track: Healthcare Operations Management

Contributed Session: Mechanism design in health systems

Chair(s): Zheng Han

093-1944 Fair Liver Transplant Allocation: A Scalable Optimization Model

Shubham Akshat, Student, University of Maryland, United States
Sommer Gentry, Professor, United States Naval Academy, United States
S. Raghavan, Professor, University of Maryland, United States

U.S. Department of Health and Human Services is interested in increasing geographic equity in liver transplants. We develop an optimization model to improve the allocation system. It reduces the supply to demand variations among proposed geographies and is scalable to zip-code level. We compare our allocations against others via simulation.

093-2253 ACO Network Entry Decision: Compensatory vs Complementary Perspective

Zhenzhen Yan, Student, Michigan State University, United States
Mei Li, Assistant Professor, Michigan State University, United States

We explore network level factors that prompt a healthcare provider into joining an ACO. We contrast a compensatory perspective with a complimentary perspective in impacting the entry decision and tested it empirically with HIMSS dataset. Our research sheds lights on important network level factors in influencing entry decisions.

093-0626 Expanding the Donor Pool: The Use of Marginal Organs for Transplantation

Sait Tunc, Post Doc/Researcher, University of Chicago, United States
Burhaneddin Sandikci, Associate Professor, University of Chicago, United States
Bekir Tanriover, Associate Professor, UT Southwestern Medical Center, United States

We study the use of marginal organs for transplantation to alleviate the burden of shortages through a queueing-theoretic framework. We investigate socially efficient and equilibrium utilizations of donor organs and introduce an incentive mechanism that helps increase the utilization of marginal organs while also improving overall social welfare.

093-1931 Models for Quality Under FFS and BP Schemes

Zheng Han, Student, University of Kansas, United States
Mazhar Arikan, Associate Professor, University of Kansas, United States
Suman Mallik, Associate Professor, University of Kansas, United States

Motivated by the recent developments in healthcare reimbursements, we develop generic models to study the impact of payment schemes on performance and profits of healthcare providers.

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479 Sunday, 02:45 PM - 04:15 PM, Columbia 7 Track: Supply Chain Management

Contributed Session: Enterprise Strategies and Operations Planning

Chair(s): Jingran Liang

093-0446 Exit Strategies for Buyers - A Comparison of East versus West

Farooq Habib, Lecturer, Cranfield University, United Kingdom
Michael Bourlakis, Professor, Cranfield University, United Kingdom
Emel Aktas, Senior Lecturer, Cranfield University, United Kingdom

Based on a sample of 400+ recently terminated business relationships, we investigate how a set of economic and social antecedents influence exit strategies of firms operating in the USA and China. For buyers we provide specific guidelines regarding how to terminate relationships with their suppliers in the East versus West context.

093-1637 Enterprise Architecture Management: An Innovative Approach for Sales and Operations Planning (S&OP)

Tobias Kreuter, Student, University of Muenster, Germany
Bernd Hellingrath, Professor, University of Muenster, Germany
Christian Kalla, Student, University of Muenster, Germany
Márcio Thomé, Assistant Professor, Pontifícia Universidade Católica do Rio de Janeiro - PUC-Rio, Brazil
Luiz Felipe Scavarda, Associate Professor, Pontifica Universidade Catolica Do Rio De Janeiro- Puc Rio, Brazil

Despite the growing interest in S&OP from practitioners and academics, the existing literature offers limited support for companies in applying S&OP and adapting it towards company-specific contexts. This paper offers an innovative solution, applying the Enterprise Architecture Management approach from Information Systems to the S&OP development in a German enterprise.

093-0963 A Robust Design for a Gas Allocation Network Planning Under Price and Demand Uncertainty

Jingran Liang, Student, Tsinghua University, China
Zhi-Hai Zhang, Associate Professor, Tsinghua University, China
Gisela Lanza, Professor, Karlsruhe Institute of Technology, Germany

We propose a model for optimal allocation of gas sources and pipeline network under price and demand uncertainty. We assertain chance constraint and associated reformulation has been applied to deal with uncertainty. An efficient algorithm is proposed and has a better performance based on the numerical experiments.

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Sunday, 02:45 PM - 04:15 PM, Columbia 8 Track: Supply Chain Management

Contributed Session: Information Asymmetry and Information Sharing

Chair(s): Fan Jiang

093-1628 Modeling Heterogeneous Production Facilities and Upstream Inventory Information Sharing in a 2-Echelon Supply Chain Network

Sandeep Srivathsan, Assistant Professor, Great Lakes Institute of Management, India
Manjunath Kamath, Professor, Oklahoma State University, United States

We develop analytical models for a two-echelon SCN consisting of two retail stores and two non-identical manufacturers with upstream inventory information sharing. We approximate the non-identical manufacturers with identical ones. The resulting model confirms effective inventory and storage management. This model can be extended to address heterogeneous multi-server queues.

093-2199 The Impact of Contracting Sequence on an Assembly System with Asymmetric Production Cost Information

Fei Lv, Lecturer, Zhongnan University of Economics and Law, China

Consider an assembly system consisting of one manufacturer and two suppliers with privately informed cost. The manufacturer contracts with the suppliers simultaneously or sequentially. We find that the manufacturer's optimal contract menus change according to the contracting sequence and the suppliers' cost structure. Different firms prefer different contracting sequences.

093-0967 Vertical Information Acquisition and Horizontal Information Sharing Strategy in a Supply Chain

Fan Jiang, Student, Renmin University of China, China
Jianghua Wu, Professor, Renmin University of China, China

We study a vertical information acquisition and horizontal information sharing strategy in a two-echelon supply chain. We identify conditions under which full information acquisition can be achieved. We show the effect of boundary equilibrium, market variation, and product substitutability on information acquisition, horizontal information sharing strategy, and supply chain's profit.

481

Sunday, 02:45 PM - 04:15 PM, Columbia 9 Track: Behavioral Operations Management

Invited Session: Behavioral dynamics in operations

Chair(s): Evgeny Kagan

093-0179 The Effect of Social Information on Demand in Quality Competition

Dayoung Kim, Assistant Professor, California State University Fullerton, United States
Vishal Gaur, Professor, Cornell University, United States
Andrew Davis, Assistant Professor, Cornell University, United States

We investigate the impact of different types (quality based vs. market-share based) of social information on the demand of firms competing through service quality. We develop a model of social and own learning of customers, conduct a lab experiment, and derive implications on firms' corresponding demand characteristics.

093-1676 The Impact of Behavioral and Economic Drivers on Gig Economy Workers

Park Sinchaisri, Student, The Wharton School, United States
Gad Allon, Professor, The Wharton School, United States
Maxime Cohen, Assistant Professor, New York University, United States

Gig economy firms benefit from labor flexibility, but ensuring that their services appeal to providers poses challenges in planning the workforce. We study on-demand workers' labor decisions in a ride-hailing context. Econometric analysis of drivers' decisions and responses to incentives has revealed behavioral insights that can inform better incentive design.

093-2138 Last Place Aversion in Queues

Ryan Buell, Associate Professor, Harvard Business School, United States

This paper explores the behavioral effects of last place aversion in queues. People in last place are more than twice as likely to switch queues and more than four times as likely to quit the queue. Queue transparency is shown to be an effective lever for mitigating these effects.

093-0740 Entrepreneurial Market Research - Theory and Experiments

Stephen Leider, Assistant Professor, University of Michigan Ann Arbor, United States
William Lovejoy, Professor, University of Michigan - Ann Arbor, United States
Evgeny Kagan, Assistant Professor, Johns Hopkins University, United States

This paper studies experimentally the performance of several search heuristics in a technology commercialization task.

482

Sunday, 02:45 PM - 04:15 PM, Columbia 10 Track: Product Innovation and Technology Management

Invited Session: R&D Project and Program Management

Chair(s): Sreekumar Bhaskaran Janne Kettunen

093-0322 Optimal Intraproject Learning

Huan Cao, Student, University of Maryland, United States
Nicholas Hall, Professor, Ohio State University, United States
Guohua Wan, Professor, Shanghai Jiao Tong University, China
Wenhui Zhao, Associate Professor, Shanghai Jiao Tong University, China

We model the tradeoff between investing time in learning from completed tasks and achieving reduced durations for subsequent tasks to minimize the total project cost. We develop a heuristic that finds near optimal solutions and our results demonstrate significant benefits from learning across projects with various characteristics.

093-1333 Management of Intellectual Asset Production in Industrial Laboratories

Debasis Mitra, Professor, Columbia University, United States
Qiong Wang, Associate Professor, University of Illinois Urbana-Champaign, United States

We develop a model-based analysis on the management of intellectual asset production in industrial laboratories. The system is characterized by a multistage research/development process. Decisions involve strategic budget allocation and tactical project management. Based on model outputs, we discuss managerial and societal implications of the optimal strategy.

093-1398 Designing Internal Innovation Contests

Lakshminarayana Nittala, Assistant Professor, University of Dayton, United States
Sanjiv Erat, Associate Professor, University of California San Diego, United States
Vish Krishnan, Professor, University of California San Diego, United States

Firms can use internal contests to source solutions to problems associated with innovation. However, designing such contests involves nuanced understanding of the impact of such contests on the on-going projects within the firm. Optimal contest design is discussed along with managerial implications.

093-1133 Sequential Product Development and Introduction by Cash-Constrained Start-Ups

Sreekumar Bhaskaran, Associate Professor, Southern Methodist University, United States
Sinan Erzurumlu, Associate Professor, Babson College, United States
Karthik Ramachandran, Associate Professor, Georgia Institute of Technology, United States

We study the trade-off between revenues that an on-hand product generates for R&D funding and the cannibalization effect it has on future products for cash-constrained startups. Results are compared to the case of an established firm (with no such cash constraints).

483

Sunday, 02:45 PM - 04:15 PM, Columbia 11 Track: Inventory Management

Invited Session: Advances in Inventory Management

Chair(s): Jianbin Li

093-0617 Optimal Inventory Control and Design Refresh Selection for Managing Part Obsolescence

Zhenyang Shi, Student, Shanghai Jiao Tong University, China
Shaoxuan Liu, Professor, Ningbo Supply Chain Innovation Institute, China

We study the dynamic part inventory control and product design refresh decisions for a manufacturer facing part obsolescence. An optimal stopping model with additional decisions is established. We show the optimality of a threshold policy for design refresh and well-structured policies including the target interval policy for part inventory management.

093-0675 Electric Vehicle Battery Capacity Allocation and Recycling with Downstream Competition

Mengping Zhu, Student, Huazhong University of Science & Technology, China
Zhixue Liu, Professor, Huazhong University of Science & Technology, China
Jianbin Li , Professor, Huazhong University of Science & Technology, China
Xiang Zhu, Associate Professor, University of Groningen, Netherlands

We study the optimal channel choice and battery capacity allocation strategies of an electric vehicle manufacturer under battery recycling. We find that only if the outside battery procurement cost is rather low, the manufacturer supplies batteries to their competitor. However, the result is the opposite in terms of social welfare.

093-0984 Managing Hybrid Manufacturing/Remanufacturing Systems: New Results and Insights

Tong Wang, Assistant Professor, Shanghai Jiaotong Univerisity, China
Xiting Gong, Assistant Professor, The Chinese University of Hong Kong, Hong Kong
Xiuli Chao, Professor, University of Michigan - Ann Arbor, United States

We study a hybrid manufacturing/remanufacturing dynamic inventory control problem with different lead times over an infinite horizon. We characterize the optimal policy, uncover the relationship between this problem with other classic inventory management problems, and propose insightful and efficient heuristic policies for this high-dimensional stochastic optimization problem.

484

Sunday, 02:45 PM - 04:15 PM, Columbia 12 Track: Service Operations

Contributed Session: New Service Models

Chair(s): Mingfang Li

093-1652 Designing Co-Working Spaces - Implications for Services and Operations Management

Ankita Tandon, Assistant Professor, FLAME Pune, India
Sushmita Narayana Aghalaya, Assistant Professor, National Institute of Industrial Engineering, India

Co-working spaces are emerging as popular innovative workspaces for flexible and remote working. This study aims to identify the variables/models that can be used to design, measure, and evaluate the performance of the more complex and uncertain environment of the co-working space through a conceptual framework.

093-1077 Conceptually Predicting Impact of Artificial Intelligence on Finance Shared Services Operations Roles

Padmaka Mirihagalla, Student, Szechenyi Istvan University, Hungary

AI technologies will force knowledge-based services to redefine operating models. Presentation focuses on predicting impact by specific AI technologies on Finance Operations job roles within shared services. Standard cognitive processes within Finance shared service roles are matched with AI technologies with predictions conceptually discussed

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093-0312 Future Challenges for Legal Services: The AI Debate

Iain Reid, Reader, Manchester Metropolitan University, United Kingdom
David Bamford, Professor, University of Huddersfield, United Kingdom
Murray Dalziel, Professor, University of Baltimore, United States
Daniel Pollick, Chief Information Officer, DWF LLP, United Kingdom

More legal firms are exposed to client empowerment and service innovation through Artificial Intelligence. This paper presents a theoretical framework for integrated service operations through tech solutions. This paper also debates the robustness of the UK's legal network and draws comparisons with other professional services.

093-2347 Delivering a New Service for End of Life Care in a Hospital: A Case Study

Shivraj Kanungo, Associate Professor, George Washington University, United States

The perceived high cost of end-of-life care tends to be a barrier to offering such services in hospitals. We study a multi-disciplinary team that conceptualized this service (estimating demand, room design,, return on investment and service requirements, etc.) and discussed implementation challenges including resource commitments, opportunity costs, and sustainability.

093-1127 Building Customer Loyalty for Online Retailers Through Product-Return Service Operations

Mingfang Li, Associate Professor, Hebei University of Science & Technology, China
Askar Choudhury, Professor, Illinois State University, United States

Strategic importance of operations management in product-returns has been increasingly recognized. Our objective is to examine the effect of the interactive support and return process in the return service to online shoppers and uncover the value-added role returns service operations play in building customer loyalty from the perspective of service recovery.

485

Sunday, 02:45 PM - 04:15 PM, Monroe Track: Humanitarian Operations and Crisis Management

Invited Session: Case studies in Humanitarian Operations

Chair(s): Gyöngyi Kovács Graham Heaslip

093-0988 Disaster Management in China: Background, Practice, and Comments

Xiang Wang, Post Doc/Researcher, University of Science and Technology of China, China

This work will present China's unique disaster management to the world. We reveal the background and reasons for the formation of national disaster management in China and deeply analyze its advantage and deficiency. Finally, we summarize China's best practice in disaster management and suggestions are presented for its further improvement.

093-1027 An Analysis of San Juan Port Capacity and the Hurricane Maria Response

Nicholas Green, Student, Air Force Institute of Technology, United States
Timothy Breitbach, Assistant Professor, Air Force Institute of Technology, United States
Daniel Steeneck, Assistant Professor, Air Force Institute of Technology, United States

This FEMA-sponsored research seeks to understand seaport capacity in Puerto Rico and whether post-disaster response cargo choked out commercial activity, thus delaying the recovery following Hurricane Maria. Empirical data was used to build a simulation model of the San Juan port and last mile truck distribution.

093-1237 Lean Recruitment: A Case Study at Aga Khan Foundation Afghanistan

Milan Ponweera, Human Resources Specialist, Aga Khan Foundation Afghanistan, Sri Lanka
Raquel Froese Buzogany, Student, University of Lugano, Switzerland
Paulo Goncalves, Associate Professor, University of Lugano, Switzerland

Humanitarian organizations in unstable or war-torn countries face long and burdensome recruitment processes that hamper the implementation of relief projects. We show how the Aga Khan Foundation Afghanistan used lean six sigma to reduce its recruitment time for international staff by more than 50% and what similar humanitarian organizations can do.

093-1535 Farmer Engagement with Markets in Rural Uganda

Micaela Wiseman, Student, Massachusetts Institute of Technology, United States
Jarrod Goentzel, Lecturer, Massachusetts Institute of Technology, United States
Timothy Russell, Post Doc/Researcher, Massachusetts Institute of Technology, United States

We randomly surveyed smallholder farmers and nearby agribusinesses in regions across Uganda to characterize their engagement. An analysis of over 500 responses characterizes how local markets meet farmers' needs for agricultural inputs, services, and opportunity to sell their harvest. This informs market facilitation efforts to increase food supply in East Africa.

486

Sunday, 02:45 PM - 04:15 PM, Lincoln East Track: Humanitarian Operations and Crisis Management

Contributed Session: Strategic Disaster Management

Chair(s): Sarah Sengupta

093-2123 Preparing for Disasters: Does Investment in Disaster Preparation Mitigate Response Requirements

Kyle Goldschmidt, Assistant Professor, University of St. Thomas, United States
Sameer Kumar, Professor, University of St. Thomas, United States

While it is clear that disaster response and recovery efforts have benefited from the increased attention and research on humanitarian operations, research in the area of disaster preparedness has been limited. We explore how investment in disaster preparedness impacts the economic and social cost of disasters.

093-2328 Disaster Management from the Perspective of Emergency Management Practitioner: What Are the Current Problems?

Attila Hertelendy, Assistant Professor, Florida International University, United States
Sushil Gupta, Professor, Florida International University, United States

We identify problems that emergency management practitioners face in real emergencies. The areas covered include evacuation, mitigation, hospital surge capacity, and the supply chain logistics. Solutions to these problems need to be developed by POM researchers. We also point to the need of relevance in POM disaster research.

093-2340 Humanitarian Logistics: How Public-Private Partnerships Can Impact Supply Chains

Sarah Sengupta, Assistant Professor, St.Cloud State University, United States
Seth Powless, Assistant Professor, Earlham College, United States

This study examines a public-private partnership (P3) shared governance supply chain model based on the use of distributed manufacturing in humanitarian logistics operations. Two cases are evaluated, low supply access in disadvantaged populations and disaster relief efforts. Implications are discussed along with areas for future research.

487

Sunday, 02:45 PM - 04:15 PM, Lincoln West Track: Empirical Research in Operations Management

Invited Session: Empirical Research in Supply Chain

Chair(s): Nitish Jain

093-0486 Finding a Market for Ugly Produce: A Multiple Discrete-Continuous Choice Analysis

Sanghak Lee, Assistant Professor, Arizona State University Tempe, United States
Stanley Lim, Student, Arizona State University, United States
Sungho Park, Associate Professor, Arizona State University Tempe, United States
Elliot Rabinovich, Professor, Arizona State University Tempe, United States

We examine demand for imperfect produce sourced from growers and sold directly to consumers via the Internet. We model consumers' multiple discrete choice and continuous consumption decisions to uncover relationships among choice, satiation effects, and utility maximization for wide assortments. We then estimate the value of assortment to improve revenues.

093-0868 Environmental Spillovers in Supply Networks

Marcus Bellamy, Assistant Professor, Boston University, United States

Firms in shared supply network relationships are likely to affect each other's environmental performance. We investigate whether such spillovers are observed and potential mechanisms responsible for such activity using FactSet supply chain relationship data and Trucost environmental supply chain data.

093-1041 When Do Supply Chain Glitches Evoke Negative Public Reaction?

Christoph Schmidt, Student, Eth Zurich, Switzerland
David Wuttke, Assistant Professor, Ebs Business School, Germany
H. Sebastian Heese, Professor, North Carolina State University, United States
George Ball, Assistant Professor, Indiana University Bloomington, United States

We extend the work of Hendricks & Singhal by examining the public reaction to supply chain glitches via Twitter. We also find support for a negative stock-market reaction to an SC glitch and discover that this negative stock-market reaction is influenced by how the public responds to the SC glitch on Twitter.

093-1095 Retailer Initiated Inventory-Based Financing

Wei Luo, Assistant Professor, I E S E, Spain
Weiming Zhu, Assistant Professor, I E S E, Spain

We study an innovative financing scheme in which a large retailer provides short-term financing to a small retailer using the inventory of the small retailer as collateral. We analyze the effectiveness of such financing scheme and explore their impact on operational decisions and contract design.

488

Sunday, 02:45 PM - 04:15 PM, Jefferson East Track: Sustainable Operations

Contributed Session: Sustainable Supply Chain Management

Chair(s): Maneesh Reddy Ajjuguttu

093-1824 Evaluation of Supply Chain Sustainability in Emerging Economies: A Three-Stage DEA-Malmquist Productivity Index

Bulent Erenay, Assistant Professor, Wilkes University, United States
Saidat Sanni, Student, Wilkes University, United States
Gokhan Egilmez, Assistant Professor, University of New Haven, United States

This study examines the sustainability performance and efficiency of select emerging economies. A Three-Stage DEA-Malmquist Environmental Productivity Index (EPI) is developed for the assessment of the relative efficiency of the countries considered. This method is employed to control the impact of random errors on the efficiency evaluation results.

093-1993 Caught Between Two Stools: Using the Paradox Lens to Understand Sustainability in Supply Chains

Alok Choudhary, Reader, Loughborough University, United Kingdom
Rohit Nishant , Associate Professor, University of Laval, Canada
Araz Zirar, Student, Loughborough University, United Kingdom

Inherent tensions of sustainability dimensions are to be reconciled within supply chains. Drawing on paradox theory and applying a mixed method approach, we identify such paradoxical elements. We propose a comprehensive framework suggesting that firms often engage in and manage tensions related to environmental initiatives to improve environmental performance.

093-2011 Win-Wins, Trade-Offs and Paradoxes Between Supply Chain Sustainability and Resilience Practices

Alok Choudhary, Reader, Loughborough University, United Kingdom
Luke Bellamy, Student, Loughborough University, United Kingdom
Grammatoula Papaioannou, Lecturer, Loughborough University, United Kingdom

Supply chain sustainability and resilience practices are rife with tensions as firms seeks to balance them. Using a mixed method approach and applying paradox lens, we explore these tensions. We propose a comprehensive integrative model, which aids management of tensions and its impact on SC.

093-2167 Operational Transparency and Slow Fashion

Maneesh Reddy Ajjuguttu, Student, Clemson University, United States
Aleda Roth, Professor, Clemson University, United States

This study addresses the effects of operational transparency on the fashion sector. We examine the consumer buyer behaviors on the movement called “slow fashion.” Slow fashion is a strategy that aims to reduce the wastes that accrue through the supply chains, which are causing havoc to the environment.

489

Sunday, 02:45 PM - 04:15 PM, Jefferson West Track: Supply Chain Risk Management

Invited Session: Supply Chain Management: Demand Uncertainty, Blockchain Technology and Online Retailing

Chair(s): Dennis Yu

093-0622 Stochastic Vehicle Routing with Representative Scenarios

Lijian Chen, Assistant Professor, University of Dayton, United States
Robert Russell, Professor, University of Tulsa, United States
Wen-Chyuan Chiang, Professor, University of Tulsa, United States

We solve the Stochastic Vehicle Routing Problem (SVRP) with stochastic demands by identifying representative scenarios to greatly improve the tractability of the real-life SVRPs. We compared our model performance with the metaheuristic and the vehicle routing model of two-stage recourse to demonstrate the gain of identifying representative scenarios.

093-0962 Is Blockchain Enabled- Supply Chain a Trustless System?

Ha Ta, Assistant Professor, Clarkson University, United States

The power of blockchain technology, which could enable full supply chain transparency and traceability, is said to lie in its trustless and immutable features. This study examines the dynamics of trust and risk management in a blockchain-enabled consumer supply chain.

093-1198 On The Study of Pricing and Capacity Allocation Decisions of an Online Platform

Shu Hu, Lecturer, Ningbo Supply Chain Innovation Institute, China
Dennis Yu, Associate Professor, Clarkson University, United States

We investigate optimal decisions of an online platform and a third-party retailer when the online platform sells products to compete with the retailer. We find that the online platform’s optimal capacity allocation is subject to unit volume and demand intensity as well as service charge of the online platform’s capacity.

093-1368 Sales Effort Coordination Between a Brick-and-Mortar Store and an Online Retailer

Ping Su, Associate Professor, Hofstra University, United States
Sarah Wu, Associate Professor, Fordham University, United States

We consider a manufacturer selling to an online retailer and a brick-and-mortar store. The online retailer free rides the sales effort of the BM store and offers lower prices, which hurts overall supply chain performance. This paper analyzes the role of manufacturer contract to coordinate supply chain sales.

490

Sunday, 02:45 PM - 04:15 PM, Georgetown East — Track: Supply Chain Risk Management

Invited Session: Blockchains in Supply Chains

Chair(s): Zhan Pang

093-2035 Managing Food Supply Chain: Traceability and Blockchain Enabled Sourcing Strategies

Zhendong Pan, Student, Purdue University, United States
Zhan Pang, Associate Professor, Purdue University, United States

In food supply chain, being able to trace a food product back to its source is crucial for quality control. With the increased traceability enabled by blockc hain, this study aims at examining a food supply chain's sourcing strategies that strike a balance between traceability and sourcing cost.

093-2375 Mechanism Design Approach to Blockchain Protocols

Abhishek Ray, Student, Purdue University, United States
Mario Ventresca, Assistant Professor, Purdue University, United States
Hong Wan, Associate Professor, North Carolina State University, United States

We demonstrate the use of game theory and mechanism design in solving the problem of centralization in blockchain systems. Using non-cooperative and cooperative game theory we propose a way of designing payoffs in order to disincentivize certain exhibited behaviors and incentivize desired behaviors of miners or validators in such systems.

093-2160 Blockchains in Supply Chains: A Prototype in a Food Supply Chain

Zhan Pang, Associate Professor, Purdue University, United States

Blockchain is emerging as a new technology to disrupt supply chains in many industries due to its unique features of immutability and the capability to embrace IOT and smart contracts efficiently. We will introduce a blockchain-based food traceability system prototype for a grocery retail chain.

491

Sunday, 02:45 PM - 04:15 PM, Georgetown West — Track: Panels & Meetings

Contributed Session: Responsive Learning Tech Corporate Session: Play an Online Game to Teach Operations

Chair(s): Sam Wood

093-2454 Responsive Learning Tech Corporate Session: Play an online game to teach operations

Sam Wood, President, Responsive Learning Technologies, United States

Littlefield is an award-winning online competitive simulator used in hundreds of schools worldwide to teach topics including process analysis, inventory control, and operations analytics. Following an introduction participants will play an accelerated game and learn about best practices for using the game. Participants are encouraged to bring a laptop.

492

Sunday, 02:45 PM - 04:15 PM, Cabinet — Track: Sustainable Operations

Invited Session: Sustainability and Contracting

Chair(s): Karthik Murali

093-1963 Committing to Contract for a Supplier's Social and Environmental Compliance

Hossein Rikhtehgar Berenji, Student, University of Oregon, United States
Nagesh Murthy, Associate Professor, University of Oregon, United States
Zhibin (Ben) Yang, Associate Professor, University of Oregon, United States

We model a supply chain in which the buyer audits the supplier's compliance with the code of conduct. We investigate the effect of buyer's upfront commitment to price and quantity on supplier's compliance. We also analyze implications of raising the standard of code of conduct on sustainability and financial performance.

093-0008 Contract Manufacturer Selection and Order Allocation Under Sustainability-Related Risks

Leke Ogunranti, Student, Drexel University, United States
Avijit Banerjee, Professor, Drexel University, United States

This study focuses on the trade-off between supply chain sustainability-related risks and low-cost outsourcing contract manufacturing. We develop an integrated model that utilizes principal component analysis for evaluating each supplier's sustainability performance, and bi-objective mixed integer programming model for suppliers' selection and order quantity allocation.

093-1852 Industry Adoption of B Corp Certification: Better Together?

Kelsey Taylor, Student, Ivey School, Canada

Using longitudinal performance data from certified B Corporations, this paper investigates how expansion of B Corp certification within an industry affects performance trajectories across multiple dimensions of sustainability at the level of individual firms.

493

Sunday, 02:45 PM - 04:15 PM, Intl Ballroom East — Track: Supply Chain Analytics

Invited Session: Development on Information and Competition in Supply Chain Management

Chair(s): Xuying Zhao

093-0961 Revisiting Bertrand Competitions in the Face of Firm Asymmetry and Customer Heterogeneity

Maxime Cohen, Assistant Professor, New York University, United States
Alexandre Jacquillat, Assistant Professor, Carnegie Mellon University, United States
Haotian Song, Student, New York University, United States

We study Bertrand competitions when firms have asymmetric capacities and face both price-sensitive and quality-sensitive customers. Surprisingly, we show that a mixed Nash equilibrium does not always exist under capacity asymmetry or quality differentiation. We then characterize epsilon Nash equilibria and draw several managerial insights.

093-1895 Information Provision Under Showrooming and Webrooming

Yuyun Zhong, Student, Drexel University, United States
Wenjing Shen, Associate Professor, Drexel University, United States
Oben Ceryan, Lecturer, Cass Business School, United Kingdom

Consumers strategically choose a product information gathering channel and product purchasing channel. Showrooming and webrooming exist when the two channels deviate. We endogenize consumers' choices of information gathering and purchasing, and examine how the online retailer provides information effectively when competing with a brick-and-mortar retailer.

093-1314 Benefits of Deploying Supply Chain Analytics in a Renewable Fuel Company

Marjut Hirvonen, Student, Aalto University, Finland
Katariina Kemppainen, Professor, Aalto University, Finland
Juuso Liesiö, Assistant Professor, Aalto University, Finland

Supply chain analytics has been deployed for strategic raw material planning and product portfolio selection in Neste Corporation. The analytics tools have been integrated with the corresponding ERP systems and business processes. This has brought significant value-add due to increased profits, cost savings in supply, logistics, and refinery processes.

093-2256 Does Increasing Channel Differentiation Help Manufacturer, Retailer, or Both?

Ting Luo, Assistant Professor, California State University Fullerton, United States
Xuying Zhao, Associate Professor, University of Notre Dame, United States

We study channel differentiation between a manufacturer-owned online channel and an independent retail channel. Increasing channel differentiation is a common way to reduce the competition between the two channels. However, does increasing channel differentiation help the manufacturer, retailer, or both?

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495 Sunday, 04:30 PM - 06:00 PM, Piscataway Track: Energy Supply Chains

Invited Session: Dynamic decision-making in commodity and energy operations

Chair(s): Selva Nadarajah

093-1556 Optimal Operational Planning in Active Distribution Networks

Panagiotis Andrianesis, Post Doc/Researcher, Boston University, United States
Michael Caramanis, Professor, Boston University, United States

The value of Distributed Energy Resources over time and location is the key driver of optimal scheduling in active distribution networks. We provide a tractable formulation of the operational planning problem capturing the salient features and costs of distribution assets that enables the discovery of short-term dynamic locational marginal costs.

093-1187 An Optimization Model for Energy Planning Under Uncertainty with Decommissioning and Depreciation Costs Considerations

Chandra Irawan, Lecturer, University of Nottingham Ningbo China, China
Peter Hofman, Professor, University of Nottingham Ningbo China, China
Hing Kai Chan, Professor, University of Nottingham Ningbo China, China
Antony Paulraj, Professor, University of Nottingham Ningbo China, China

The paper proposes a stochastic model for national/regional power generation planning of electric systems for medium/long-term analysis. The model aims to determine the optimal mix of energy supply sources to minimize total costs and emissions produced. A matheuristic approach is proposed to find good solutions within an acceptable computational time.

093-1559 Network Investment Deferral Through Optimal Integration of Distributed Energy Resources

Panagiotis Andrianesis, Post Doc/Researcher, Boston University, United States
Michael Caramanis, Professor, Boston University, United States

In the traditional distribution network planning process, utilities have dealt with load growth by commensurate network hardware investments. We explore how distribution network short-run marginal cost based prices may attract Distributed Energy Resources that can mitigate capacity shortfalls and defer/offset network investments.

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496 Sunday, 04:30 PM - 06:00 PM, Oak Lawn Track: Marketing and Operations Management

Contributed Session: Product Lines, Scheduling and Inventory

Chair(s): Felix Papier

093-1598 Product Bundling in Distribution Channels under Warm-glow Effect

Jie Wu, Professor, University of Science and Technology of China, China
Mingjun Li , Student, School of management, China
Xiang Ji, Student, University of Science and Technology of China, China

Non-economic factors should be paid careful attention to when making business decisions. Today, firms who start crowdfunding projects often offer a donation option to consumers to generate funding. We study a manufacturer's optimal bundling and pricing strategy when the manufacturer sells through either a centralized or decentralized channel.

093-2294 How to Meet the Diverse Needs of Consumers: Big Data Mining Based on Online Reviews

Wei Gu, Associate Professor, University of Science and Technology Beijing, China
Rui Hu, Assistant Professor, Beijing City University, China
Xiangbin Yan, Professor, University of Science and Technology Beijing, China
Yanan Song, Post Doc/Researcher, Donlinks School of Economics and Managem, China

How to meet the diverse needs of consumers is the number one problem facing every restaurant. This research applied big data mining method to propose a new framework in finding the critical success factor for a restaurant. The results showed that diner group characteristics, food taste, and promotional channel were decisive.

093-0228 Call-Center-Based Scheduling of Sales Field Visits

Yanlu Zhao, Student, Essec Business School, France
Felix Papier, Professor, Essec Business School, France

Motivated by the sales operations of a B2B services company, we develop a model for scheduling customer appointments. We formulate an MDP, develop heuristics, and perform numerical experiments with a real data set. We find that appointment scheduling can achieve a strategic trade-off among sales force effectiveness, efficiency, and reactivity.

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497 Sunday, 04:30 PM - 06:00 PM, Northwest Track: Social Media and Internet of Things

Invited Session: Special Topics - Social Media Applications

Chair(s): Dan Wang

093-2142 Delaying Consent: An Empirical Investigation of Mobile Apps' Upgrade Decisions

Raveesh Mayya, Student, University of Maryland, United States
Siva Viswanathan, Associate Professor, University of Maryland, United States

We study apps' decisions to upgrade to Android 6.0 which restricts their ability to seek blanket permissions to sensitive user information at download, instead requiring them to request standalone permissions at run-time. We find that apps that traditionally over-seek permissions strategically delay upgrading, and such delays hurt app ratings.

093-1604 Exploring Users' Payment Behavior: Why Users Pay for Live Discussions in Online Knowledge Community

Xiao Shi, Student, University of Science and Technology of China, China
Xiabing Zheng, Associate Professor, University of Science and Technology of China, China
Feng Yang, Associate Professor, University of Science and Technology of China, China

The online knowledge community provides live discussions for users to interact with content creators synchronically, which requires payment before acquiring knowledge. Motivated by the raising attention of live discussions, we propose a persuasion model to investigate users' motivation to pay for live discussions in the online knowledge community.

093-1510 Twitter Analytics for Fashion Supply Chain Management

Olena Rudna, Student, Rutgers University, United States

Uncertainty in demand planning for fashion industry was growing over the past decade. Using Twitter, corpus accumulated from 2012 to 2018; we identified fashion trends and evaluated the outcomes against the actual data by applying natural language processing and machine learning techniques.

093-1160 Build Your Brand on Social Media? An Empirical Analysis of Short-Video Celebrity

Dan Wang, Student, Tongji University, China
jia gao, Student, shanghai jiaotong university, China

With the intensification of product market competition, social media has become a new battlefield of marketing. Using data from a fast-growing social media platform in China, we study the interaction between Internet Celebrity and his/her fans regarding product advertisement performed by Internet Celebrity as well as its implication on brand itself.

498

Sunday, 04:30 PM - 06:00 PM, Morgan Track: Purchasing and Supplier Management

Contributed Session: Managing buyer-supplier relationships

Chair(s): Wc Benton

093-2262 The Effect of Network Governance on Supplier Opportunism: An Agent-Based Model

Yang Yang, Assistant Professor, University of Texas at El Paso, United States
Thomas Kull, Associate Professor, Arizona State University Tempe, United States
Piyush Shah, Student, Arizona State University, United States

Using an agent-based model, we compared three governance mechanisms that reduce supplier opportunism. We found that network governance, as an informal mechanism, is as effective as formal mechanisms such as monitoring and providing incentives. We also considered different levels of market competition and outcome uncertainty.

093-2296 How Supplier Satisfaction in Industrial Buyer-Supplier Relationships Develop Over Time: Literature Overview and Initial Analyses

Sigrid Weller, Student, Graz University of Technology, Austria
Niels Pulles, Assistant Professor, University of Groningen, Netherlands
Bernd Markus Zunk, Associate Professor, Graz University of Technology, Austria

Industrial firms try to reduce their supply base for strategic cost reasons. Therefore, literature identifies high supplier satisfaction as a precondition and crucial success factor. This research provides: A) a literature overview and B) an initial analysis of the impact of time aspect on supplier satisfaction.

093-1146 Supplier Conflict, Customer Defections, and Manufacturer Sales Performance: Role of Supplier Governance

Saurabh Ambulkar, Assistant Professor, Northeastern University, United States
Nada Sanders, Professor, Northeastern University, United States

In this study, we examine a triadic issue of how a manufacturer's conflict with suppliers upstream can increase customer defection downstream, and how the latter impacts the manufacturer's sales performance. We also examine the efficacy of supplier governance strategies: contract utilization and solidarity in mitigating this negative impact.

093-2016 The Influence of Governance Mechanisms on Supplier Performance

Wc Benton, Professor, Ohio State University, United States
Carol prahinski, Associate Professor, Michigan State University, United States
Ying Fan, Associate Professor, University of Colorado Colorado Springs, United States

Responsibile for purchasing professionals are to monitor supplier performance. This study suggests that supplier performance is mediated by cooperation and commitment and that governance power directly affects communication between buying and selling organizations. Competitive pressure is found to have a negative or insignificant influence on supplier performance.

500

Sunday, 04:30 PM - 06:00 PM, Jay Track: Emerging Topics in Operations Management

Invited Session: Data-Driven Optimization

Chair(s): Sean Barnes Margret Bjarnadottir

093-1087 Maximizing Demand Fulfillment Probability Under Input Uncertainty

Canan Gunes Corlu , Assistant Professor, Boston University, United States
Bahar Biller, Senior Scientist, Sas Institute, United States
Sridhar Tayur, Professor, Carnegie Mellon University, United States

We study a budget-constrained multi-item inventory system where the goal is to maximize the demand fulfillment probability in the presence of unknown demand parameters that are estimated from limited amounts of demand data. Our goal is to investigate the impact of the unknown demand parameters on the demand fulfillment probability.

093-1910 Data-Driven Robust Resource Allocation With Isotonic Cost Functions

Ye Chen, Assistant Professor, Virginia Commonwealth University, United States
Nikola Markovic, Assistant Professor, University of Utah, United States
Ilya Ryzhov, Associate Professor, University of Maryland, United States
Paul Schonfeld, Professor, University of Maryland, United States

We consider a two-stage resource allocation problem, motivated by two-tiered city logistics, in which the second-stage cost functions are uncertain, but known to be monotonic. We use a robust optimization approach with a novel data-driven uncertainty set construction based on a statistical goodness-of-fit test for isotonic regression.

093-2278 Choosing the Appropriate Data-Driven Inventory Policy: What to Learn From the Data?

Ke Ren, Student, University of Pittsburgh, United States
Hoda Bidkhori, Assistant Professor, University of Pittsburgh, United States
Zuo-Jun Max Shen, Professor, University of California Berkeley, United States

In this presentation, we investigate a data-driven continuous-review inventory problem for a warehouse facing unknown non-stationary demands. No assumptions are made about the forms of the demand distributions or their transition properties. We learn and update the inventory policies using both historical and daily observed demand data.

093-0948 The Impact of Predictive Model Accuracy on the Performance of Prescriptive Optimization

Sean Barnes, Assistant Professor, University of Maryland, United States
Margret Bjarnadottir, Assistant Professor, University of Maryland, United States

Using prediction models to support decision-making is becoming increasingly more prevalent, but the impact of the quality of the former on the outcome of the latter has not been explored in depth. We examine this relationship for newsvendor and knapsack problems which underscores the need to weigh multiple approaches.

501

Sunday, 04:30 PM - 06:00 PM, Holmead East Track: Global Supply Chain Management

Invited Session: Empirical Research in Supply Chain Management

Chair(s): Yan Dong Yuqi Peng

093-0620 The Resilience of Airline Networks to Severe Weather

Beverly Osborn, Student, Ohio State University, United States
Hyunwoo Park, Assistant Professor, Ohio State University, United States
Christian Blanco, Assistant Professor, Ohio State University, United States

Climate change can negatively affect the airline industry. We empirically study the relationship between airline network structure and the impacts of severe weather events, using data from the Bureau of Transportation Statistics (2003-2017). We measure network concentration using the Herfindahl-Hirschman Index and compare the propagation of delays between networks.

093-2043 Machine Learning-Based Pricing in Online Marketplaces

Mike Chapple, Associate Professor, University of Notre Dame, United States
Robert Easley, Professor, University of Notre Dame, United States
Hong Guo, Associate Professor, University of Notre Dame, United States
Sriram Somanchi, Assistant Professor, University of Notre Dame, United States
Xuying Zhao, Associate Professor, University of Notre Dame, United States

Merchants compete intensely for potential customers in online marketplaces such as Amazon. Setting the prices in such a highly dynamic, competitive environment is a challenging problem. In this paper, we build a machine learning-based demand prediction model and then derive the corresponding pricing strategy to improve sales.

093-2084 Recall Analytics and Supply Chain Risk

Ahmet Colak, Assistant Professor, Clemson University, United States
Robert Bray, Associate Professor, Northwestern University, United States

Using a sample of 1M consumer defect reports and 15K component-level auto recalls, we study how the US government and automakers improve fleet quality via recalls. We use complaint text mining and structural econometrics to predict the likelihood of recall events. We also estimate the underlying government deterrence effects.

093-1107 Managing Supplier R&D Resources and Risks

Yuqi Peng, Student, University of South Carolina, United States
Yan Dong, Associate Professor, University of South Carolina, United States
Sriram Venkataraman, Assistant Professor, University of South Carolina, United States

Recently, integrating supplier knowledge base has attracted a lot of attention in operations literature and practice. How supplier R&D efficiency affects customer innovation outcomes, however, has not been empirically studied at firm level. Our research fills this gap and provides useful insight into the mechanism of innovation spillover with supply chain.

502

Sunday, 04:30 PM - 06:00 PM, Holmead West Track: Retail Operations

Invited Session: Emerging retail pricing and promotion strategies

Chair(s): Bharadwaj Kadiyala

093-0289 Information Sharing and Product Quality in Online Markets with Product Reviews

Dongwook Shin, Assistant Professor, Hong Kong University of Science and Technology, Hong Kong
Assaf Zeevi, Professor, Columbia University, United States

This paper investigates a retailer's incentive to share their private information about demand. In traditional settings, the retailer does not have an incentive to share information about demand with a manufacturer. However, when the retailer operates with product reviews, we show that the retailer may opt to share information.

093-0426 Operational Execution and POP Display Effectiveness: Evidence from Adoption of an IoT Technology

Yannis Stamatopoulos, Assistant Professor, University of Texas Austin, United States
Jacob Zeng, Student, The University of Texas at Austin, United States
Ashish Agarwal, Associate Professor, The University of Texas at Austin, United States

This study uses the adoption of an innovative IoT technology by a brick-and-mortar retail chain in the United States to evaluate the operational execution of promotional inventory campaigns and its impact on the effectiveness of those campaigns. We uncover several interesting phenomena.

093-0737 Dynamic Pricing with Delayed Incentives

Bharadwaj Kadiyala, Assistant Professor, Hong Kong University of Science and Technology, Hong Kong
Ozalp Ozer, Professor, University of Texas Dallas, United States
Xiao Zhang, Assistant Professor, Saint Louis University, United States

Retailers today are increasingly offering delayed incentive promotions, such as gift cards, rebates, post-purchase price matching, in various industries to stimulate short-term sales. We investigate the underlying mechanism that drives customers' response to delayed incentives and explore its impact on the retailer's dynamic pricing and inventory management strategies.

093-1454 Less Can Be More in Price Experimentation

Georgia Perakis, Professor, Massachusetts Institute of Technology, United States
Divya Singhvi, Student, Massachusetts Institute of Technology, United States

We consider a dynamic pricing problem where a monopolist is selling a single product, but has no knowledge of the demand curve which is assumed to be non parametric. We construct an efficient learning algorithm with provable regret guarantees which use very limited price experimentation and price changes.

503

Sunday, 04:30 PM - 06:00 PM, Gunston East Track: Purchasing and Supplier Management

Invited Session: Digital transformation of SMEs in the supply chain

Chair(s): Wolfgang Kersten

093-1861 Towards Digital Leadership in SME

Merlin Müller, Student, Hamburg University of Technology, Germany
Florian Dörries, Student, Hamburg University of Technology, Germany
Wolfgang Kersten, Professor, Hamburg University of Technology, Germany

Modern digital technologies create new requirements for leadership. Managers, especially in SME, have to improve their skills on digital leadership. We deduce a unified model - based on qualitative empiric data to guide management development.

093-1870 Improving Supplier Networks by the Use of Artificial Intelligence

Martin Brylowski, Student, Hamburg University of Technology, Germany
Sven Reimers, Student, Hamburg University of Technology, Germany
Wolfgang Kersten, Professor, Hamburg University of Technology, Germany

Nowadays, supplier networks are influenced i.a. by a deep merging of OEM and SME value creating activities. This increases the complexity and risk of the supplier network. We improve the design of supplier networks by analyzing supplier KPIs and OEM demands with artificial intelligence to minimize complexity and risks.

093-1873 Opportunities for Smart Replenishment Using IoT Devices

Sandria Weisshuhn, Student, Kuehne Logistics University, Germany
Kai Hoberg, Professor, Kuehne Logistics University, Germany

Internet-of-things (IoT) technology is enabling many new solutions and business models for supply chain management. Using IoT devices firms can now monitor usage patterns and inventory information at the point-of-consumption (PoC). We analyze how they can leverage this data to improve replenishment decisions.

093-1816 Digital Maturity of Supply Chain Companies

Wolfgang Kersten, Professor, Hamburg University of Technology, Germany
Marius Indorf, Student, Hamburg University of Technology, Germany
Birgit Von See, Student, Hamburg University of Technology, Germany
Amad Saeed, Student, Hamburg University of Technology, Germany

A successful digital transformation requires all supply chain participants to achieve a defined level of digital maturity. In order to comparatively evaluate the state of digitalization of aerospace industry suppliers, we analyze digital maturity models in a transatlantic research project together with Canadian and German research and industry partners.

504

Sunday, 04:30 PM - 06:00 PM, Gunston West Track: Next Generation Operations

Invited Session: Global Health Operations

Chair(s): Karthik V. Natarajan

093-1052 Performance Metrics for Emergency Response Network Design

Alexander Rothkopf, Lecturer, Massachusetts Institute of Technology, United States

Jason Acimovic, Assistant Professor, Penn State University State College, United States
Jarrod Goentzel, Lecturer, Massachusetts Institute of Technology, United States

We use a stochastic LP to model an emergency response organization's network of warehouses to serve sudden onset disasters. We develop multiple performance metrics to characterize the risk portfolio, the supply portfolio, and the carrier portfolio to support decision-makers in evaluating status-quo and potential optimization of their operations.

093-1413 Benefits of Combining Early Aspecific Vaccination with Later Specific Vaccination

Rommert Dekker, Professor, Erasmus University Rotterdam, Netherlands
Willem Jaarsveld, Van, Assistant Professor, Eindhoven University of Technology, Netherlands
Lotty Duijzer, Lecturer, Erasmus University Rotterdam, Netherlands

Timing is of crucial importance for successful vaccination. To avoid an outbreak, vaccines should be administered as quickly as possible. However, during early stages of an outbreak, information on the disease is limited. In this paper, we study the resulting trade-off between vaccination timing and an effective response strategy.

093-1732 Supply Chain Interventions to Mitigate Health Commodity Stock-Outs: An Empirical Study of Field Data

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

Public health supply chains in developing countries commonly utilize two distribution systems to deliver commodities from upstream warehouses to health facilities in the last-mile, namely pull and push distribution. We use data from the field to develop contingencies of pull-push strategies.

505

Sunday, 04:30 PM - 06:00 PM, Fairchild East Track: POM in Practice

Contributed Session: Strategic Designs of Sourcing, Shipping and Subsidy

Chair(s): Jiayi Yu

093-1583 Deliver or Not? Optimal Revenue, Capacity, and Delivery Fee Policies for Future Drone-Based Delivery System

Zhangchen Hu, Student, University of Massachusetts Amherst, United States
Heng Chen, Assistant Professor, University of Nebraska Lincoln, United States
Senay Solak, Associate Professor, University of Massachusetts Amherst, United States

Drones are expected to be used in the near future as delivery tools by retailers and courier companies. We formulate a stochastic dynamic programming model to determine the optimal revenue, capacity, and delivery fee policies under uncertain demand for future drone-based delivery systems based on currently available retail data.

093-0211 Demurrage and Detention: Seeking Clarity, Simplification, and Accessibility Regarding Billing and Dispute Resolution Processes

Drew Stapleton, Professor, University Wisconsin La Crosse, United States

The FMC strongly believes, rather than dictates, that markets and commercial negotiations are needed to best determine demurrage/detention fees. Shippers long have contended that ocean carriers/marine terminals use these fees not only as a punitive measure to combat excess free time, but as revenue generators.

093-1267 Tracing the Route in the Strategic Sourcing Journey: Development and Implementation of a Hybrid Framework

Marco Formentini, Associate Professor, Audencia Business School, France
Marco Boem, Management consultant, Novalia Srl, Italy
Pietro Romano, Associate Professor, Universita Di Udine, Italy
Lisa Ellram, Professor, Miami University, United States

We present a novel strategic sourcing framework, designed and developed in collaboration with a leading international company through a longitudinal action research process. The framework processes key qualitative and quantitative data to translate coherently strategic decisions into practice. Its hybrid nature integrates strategic focus, power balance and complexity perspectives.

093-2266 Improving Consumer Welfare and Manufacturer Profit via Government Subsidy Programs: Subsidizing Consumers or Manufacturers?

Jiayi Yu, Post Doc/Researcher, Tsinghua University Department of IE, China
Christopher Tang, Professor, University of California Los Angeles, United States
Zuo-Jun Max Shen, Professor, University of California Berkeley, United States

Motivated by a subsidy program developed by the Chinese government, we present a parsimonious model to determine the optimal subsidy program in different settings so as to gain a better understanding about the conditions under which it is optimal for the government to subsidize consumers only, manufacturers only, or both.

506

Sunday, 04:30 PM - 06:00 PM, Fairchild West Track: Socially Responsible Operations

Invited Session: Emerging topics in social responsibility

Chair(s): Anyan Qi Jiayu Chen

093-0224 Building Alliances for Corporate Social Responsibility

Han Zhang, Student, Indiana University Bloomington, United States
Ruth Beer, Assistant Professor, Indiana University Bloomington, United States
Kyle Cattani, Associate Professor, Indiana University Bloomington, United States

Five well-known companies succeeded at raising funds to audit suppliers for compliance despite the incentive of companies to free ride. Our model explains the phenomenon using an invitation stage and heterogeneity in status. Our experimental results show that the invitation stage is key and status influences whether the invitation succeeds.

093-0598 Strategic Shortage in Agricultural Supply Chains with Consumer Anxiety: Effects of Government Interventions

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

Strategic shortages that lead to an exorbitant increase in retail prices of essential commodities despite inventory availability is a matter of great concern for the governments who employ a range of strategies to mitigate this phenomenon and its impact. This work develops analytical models to capture the dynamics of speculative shortages.

093-1051 Shared Supplier Capacity as a Barrier to Socially Responsible Sourcing

Jacob Chestnut, Assistant Professor, Cornell University, United States
Ravi Anupindi, Professor, University of Michigan Ann Arbor, United States

This experimental project considers the role of buyer behavior in their supplier's performance along the dimension of social sustainability. We attempt to understand the relevant factors suppliers use when creating a preference ranking over buyers. Thereby allowing assessment of the effectiveness of the levers that a "good buyer" might employ.

093-0518 Will Squeezing Profit Margin Improve Suppliers' Socially-Responsible Efforts?

Jiayu Chen, Student, University of Texas Dallas, United States
Elena Katok, Professor, University of Texas Dallas, United States
Anyan Qi, Assistant Professor, University of Texas Dallas, United States

Prominent buyers' reputation might be damaged because of their suppliers' noncompliance of socially-responsible practices. Existing empirical and theoretical evidences suggest that squeezing profit margin of a supplier would increase its socially-responsible efforts. We conducted behavioral experiments to explore how suppliers make their decisions in a socially-responsible supply chain.

507

Sunday, 04:30 PM - 06:00 PM, Embassy — Track: Environmental Operations Management

Contributed Session: Reverse Logistics

Chair(s): Rajat Mishra

093-0451 The Reverse Logistics of Electrical and Electronic Equipments from a Roadmap Perspective

Guilherme Laureano, Student, Federal University of Santa Catarina, Brazil
Lucila Campos, Associate Professor, Federal University of Santa Catarina, Brazil
Mônica Luna, Associate Professor, Federal University of Santa Catarina, Brazil
André Helleno, Professor, Universidade Metodista de Piracicaba, Brazil
Diego Vazquez-Brust, Professor, Federal University of Santa Catarina, United Kingdom

The objective of this research was the construction of a roadmap to assist the strategic management of innovation in the implementation of reverse logistics for electronic products and their components in the state of Santa Catarina, Brazil. From the implementation of the roadmap, short, medium, and long-term actions were designed.

093-1332 Estimation of Electronic Waste to Improve Reverse Logistics Operations: A Comparison of Optimized Grey Models

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

Accurate e-waste predictions figure prominently in constructing an effective reverse logistics framework for waste collection, recycling, and disposal operations. Grey modeling-based prediction techniques are appropriate for forecasts with limited data. This study presents an optimized grey modeling -based forecast for e-waste generation while providing a comparative analysis.

093-1897 Overview of Reverse Logistics for Empty Pesticide Containers in Brazil

Karina Marsola, Student, University of Campinas, Brazil
Bruna Lopes, Student, University of Campinas, Brazil
Andréa Oliveira, Professor, University of Campinas, Brazil

Reverse Logistics (RL) of empty pesticide containers (EPC) act as a reverse distribution chain that mitigate the amount of products discarded. In 2017, 94% of EPC re-entered the system using return freights in 98% of cases. Hindrances and conditions of the success of this RL chain will be presented

093-1957 Role of Knowledge Management System in Reverse Logistics

Randy Napier, Assistant Professor, UT Arlington, United States
Rajat Mishra, Assistant Professor, Stephen F Austin State University, United States

Knowledge is considered as a resource. When the employees are trained so that they acquire the 'knowledge', as defined by Nonaka (1994), leading toward the efficient implementation of operational practices, it will lead to successful design and implementation of Reverse logistic processes.

508

Sunday, 04:30 PM - 06:00 PM, Du Pont — Track: Revenue Management and Pricing

Invited Session: A Modern Intersection between Social Media and Revenue Management

Chair(s): Pelin Pekgun Sanghoon Cho

093-0335 The Race for Online Reputation: Implications for Firms, Platforms, and Consumers

Mingwen Yang, Student, University of Texas Dallas, United States
Eric Zheng, Professor, University of Texas Dallas, United States
Vijay Mookerjee, Professor, University of Texas Dallas, United States

We study online reputation competition and consider a market consisting of firms that compete for sales that are influenced by their own ratings and the mean market rating. Each firm exerts effort to improve its ratings, but in doing so, also influences the mean market rating.

093-1386 The Impact of Online Product Reviews on Retailer's Pricing and Return Policy Decisions

Mehmet Altug, Assistant Professor, George Washington University, United States

We study a monopolist retailer selling an experience good over two periods to customers with uncertain valuations. After the first-period buyers share their ex-post valuations online and the second-period buyers update their valuations. Surprisingly, we show the retailer offers a more lenient refund compared to the case with no reviews.

093-1621 Price to Gain or Price to Retain? An Empirical Study of Customer Cancellation Behaviour

Dan Zhang, Associate Professor, University of Colorado Boulder, United States
Xiao Huang, Associate Professor, Concordia University, Canada
Jian Wang, V.P., The Rainmaker Group, United States

We use hotel transaction data to investigate the customer cancellation behavior. We show that cancellation rates are highly correlated with prices at the time of booking and at the time of cancellation. We then fine-tune the classical overbooking model and discuss the implications of this finding on hotel revenue.

093-1948 Competitive Spillover Effects of User Generated Content on Hotel Demand

Sanghoon Cho, Student, University of South Carolina, United States
Pelin Pekgun, Associate Professor, University of South Carolina, United States
Ramkumar Janakiraman, Professor, University of South California, United States
Jian Wang, Vice President, The Rainmaker Group, United States

We investigate the impact of user-generated content on hotel performance as captured by actual hotel bookings. We propose and estimate a consumer learning model that focuses on the effect of review sentiment on hotel demand taking into account the effect of competition and hotel prices.

509

Sunday, 04:30 PM - 06:00 PM, Cardozo Track: Economics Models in Operations Management

Invited Session: Emerging topics in OM: Cooperation and Incentive Schemes

Chair(s): Tim Kraft

093-1878 Why Voluntary Time-of-Use Tariffs Struggle to Penetrate the Residential Electricity Sector

Dong Gu Choi, Assistant Professor, Postech, South Korea
Michael Lim, Associate Professor, Seoul National University, South Korea
Valerie Thomas, Professor, Georgia Institute of Technology, United States
Karthik Murali, Assistant Professor, Oregon State University, United States

The uptake of voluntary time-of-use tariffs remains sluggish among residential consumers despite its benefits to society as well as private utilities. In this paper, we investigate how heterogeneity in consumer use-preferences complicates the problem of designing a voluntary time-of-use scheme, resulting in a socially sub-optimal level of deployment.

093-1894 Role of Uncertainty in Compensation Plans

Rashmi Sharma, Student, Penn State University University Park, United States
Elena Katok, Professor, University of Texas Dallas, United States
Saurabh Bansal, Assistant Professor, Penn State University University Park, United States

We consider a decisionmaker who chooses an optimal price to propose to a price-sensitive client. We consider a number of different contracts that the firm uses to pay the manager. We first study how these contracts affect the manager's pricing decisions; then we report results of a laboratory study.

093-2055 Cooperative Game Theory in Humanitarian Disaster Relief

Hasti Rahemi, Student, University of Colorado Boulder, United States
David Drake, Assistant Professor, University of Colorado Boulder, United States

In this paper, we study horizontal cooperation between humanitarian organizations in the United Nations Humanitarian Response Depot (UNHRD). In the context of cooperative game theory, we discuss humanitarian organizations' motivations to participate in the cooperation.

093-2129 Cooperation Among Online and B&M Retailers: Returns and Induced Customer Traffic Implications

Maryam Mahdikhani, Student, Rutgers Business School, United States
Tolga Aydinliyim, Associate Professor, Baruch College, United States
Monire Jalili, Assistant Professor, Cleveland State University, United States

Motivated by partnerships between online and B&M retailers where the online retailer operates a micro store within the B&M store (e.g., Amazon within Kohl's), we study consumers' returns channel choice and induced B&M store customer traffic implications as well as when such partnerships are profitable for the involved parties.

511

Sunday, 04:30 PM - 06:00 PM, Columbia 1 Track: Scheduling and Logistics

Contributed Session: Port Operations and Container Management

Chair(s): Amir Gharehgozli

093-0373 A Time-Based Policy for Empty Container Management by Consignees

Benjamin Legros, Associate Professor, EM Normandie, France
Yann Bouchery, Associate Professor, EM Normandie, France
Jan Fransoo, Professor, Kuehne Logistics University, Germany

We investigate if consignees should manage empty containers to enable direct reuse by consignors. We account for non-linear holding costs as well as positive initial costs due to cleaning. We propose a two-threshold time based policy and we analyze the impact of this practice on the level of direct reuse.

093-2248 Optimal Contract Design for Truck Permit Exchange in Port Hinterland Area

Dongjun Li, Student, Newcastle University, United Kingdom
Jingxin Dong, Professor, Newcastle University, United Kingdom

Transferable permit is proposed in the study to resolve the truck congestion issue in the Port Hinterland area. Both a centralized model and a decentralized model have been developed respectively. A buy-back contract for the decentralized model has been proved to be optimal and has the same performance as a centralized model.

093-0496 Disaster Management in Port Operations

Dylan Folkman, Student, University of Maryland Baltimore County, United States
Amir Gharehgozli, Assistant Professor, California State University Northridge, United States

Hurricane Harvey pushed a large amount of sediment into the Houston Ship Channel, decreasing the depth of the port. As a result, larger vessels need to de-ballast in order to reduce their draft and enter the port. Simulation is used to simulate the operations at the port.

512

Sunday, 04:30 PM - 06:00 PM, Columbia 2 Track: Operational Excellence

Contributed Session: Implementing and sustaining Operational Excellence

Chair(s): Julius Ayodele

093-1411 Does Assessing Change Assist Change? Evidence From a Field Experiment

Torbjørn Netland, Assistant Professor, Eth Zurich, Switzerland
David Erkens, Assistant Professor, Georgetown University, United States
Jason Schloetzer, Associate Professor, Georgetown University, United States
Kasra Ferdows, Professor, Georgetown University, United States

When launching an operational excellence program, a critical question is how to assess and assist its implementation. Should headquarters formally dispatch a team of experts to assess the progress in each unit, or should the units do self-assessment and report the results to the headquarters?

093-0526 Antecedents of Behavior Supporting Bottom-Up Operations Strategy Formation

Thilo Scholz, Student, Whu - Otto Beisheim School of Management, Germany
Arnd Huchzermeier, Professor, Whu - Otto Beisheim School of Management, Germany
Torsten Kühlmann, Student, Whu - Otto Beisheim School of Management, Germany

Companies with high levels of bottom-up participation in operations strategy formation by operational employees display superior productivity improvements. Our operations strategy opportunity-motivation-ability (OMA) framework proposes that such operations strategy-supportive behavior depends on contextual top-down and personal bottom-up antecedents. The latter mediate the relation between the contextual antecedents and strategy-supportive behavior.

093-0015 Sustaining Continuous Improvement and the Influence of Teams Characteristics

Guilherme Tortorella, Assistant Professor, Universidade Federal De Santa Catarina, Brazil
Flavio Fogliatto, Professor, Universidade Federal Do Rio Grande Do Sul, Brazil
Rapinder Sawhney, Professor, University of Tennessee Knoxville, United States
Michel Anzanello, Associate Professor, Department of Industrial Engineering - UFRGS, Brazil

This study examines the influence of teams characteristics on the sustainability of Continuous Improvement (CI). Two identical cells undergoing a CI implementation were assessed through a mixed-method approach. Results indicate that team seniority within the company, age, and membership time are relevant to effectively sustain CI initiatives.

093-2320 Exploring the Role of Open Innovation in Operational Excellence

Julius Ayodele, Student, University of the West of Scotland, United Kingdom
Nikhil Varma, Assistant Professor, Ramapo College of New Jersey, United States
Arvind Upadhyay, Senior Lecturer, University of Brighton, United Kingdom

Rapid radical technological innovation has already been making firms look beyond their boundaries. Previously, most firms would rather depend on their own internal knowledge or develop their own technology internally rather than optimising external knowledge. The purpose of this paper is to explore open innovation for achieving operational excellence.

513

Sunday, 04:30 PM - 06:00 PM, Columbia 3 Track: Next Generation Operations

Contributed Session: Blockchain Applications

Chair(s): David Herold

093-2063 Blockchain and Anonymity: An Empirical Study on Consumer Perceptions of In-Home Delivery

John Gardner, Associate Professor, Brigham Young University, United States
Hugo DeCampos, Assistant Professor, Wayne State University, United States
Jim Brau, Professor, Brigham Young University, United States
Krista Gardner, Student, Brigham Young University, United States

Blockchain and its ability to maintain anonymity in e-commerce transactions may impact consumer behavior. Using a scenario-based experiment this empirical study looks at how blockchain-enabled anonymity impacts consumer willingness to allow in-home delivery.

093-1534 Blockchain Technology and Sustainable Supply Chain Management: A Barriers Analysis

Mahtab Kouhizadeh, Student, Worcester Polytechnic Institute, United States
Sara Saberi, Assistant Professor, Worcester Polytechnic Institute, United States
Joseph Sarkis, Professor, Worcester Polytechnic Institute, United States

Blockchain, as a distributed digital ledger which ensures transparency, traceability, and security is showing promise for easing some supply chain problems. This study provides a comprehensive overview of various barriers of adopting blockchain to manage sustainable supply chains. The relative importance and interrelationships between the barriers is the main focus.

093-1934 Blockchain Announcements and Their Transformative Effects

Daniel Nielubowicz, Student, Clemson University, United States
Aleda Roth, Professor, Clemson University, United States

Blockchains are perceived as key to solving industry issues around accountability, traceability, and transparency. We utilize company announcements to illustrate the key drivers of blockchain adoption and its effects on the supply chain.

093-0022 An Organisational Theoretic Review of Logistics Management Literature for Blockchain Applications

Mario Dobrovnik, Post Doc/Researcher, Vienna Univ of Econ & Business Admin, Austria
David Herold, Post Doc/Researcher, Vienna Univ of Econ & Business Admin, Austria
Jasmin Mikl, Student, Vienna Univ of Econ & Business Admin, Austria
Marko Hribernik, Post Doc/Researcher, Vienna Univ of Econ & Business Admin, Austria
Sebastian Kummer, Professor, Vienna Univ of Econ & Business Admin, Austria

Blockchain applications for logistics have gained increasing attention within academia. However, the majority of existing research lacks theoretical foundations. In response, this paper categorizes recent literature in logistics using traditional and emerging organisational theories, thereby critically evaluating the research and identifying future directions of logistics management practices regarding blockchain applications.

514

Sunday, 04:30 PM - 06:00 PM, Columbia 4 Track: Healthcare Analytics

Invited Session: Data-driven hospital operations management

Chair(s): Martin Copenhaver

093-1104 Estimated Time-to-Discharge: Building the ETA for Hospitals

Dimitris Bertsimas, Professor, MIT Operations Research Center, United States
Jean Pauphilet, Student, MIT Operations Research Center, United States

We investigate how machine learning can provide precise information about a patient's length of stay (LOS), using data from EHRs. Combining expertise-driven modeling and data analysis tools, we are able to predict 24-hour discharges and more-than-14-day LOSs with an AUC of 0.965 and 0.881 respectively.

093-1687 Patient Flow Dynamics in Inpatient Wards

Jing Dong, Assistant Professor, Columbia University, United States

Taking a data-driven approach, I will introduce a new class of queueing models that takes into account the most salient features of patient flow dynamics in inpatient wards. I will also introduce some efficient approximation techniques for performance analysis and optimization.

093-2165 Association Between Socioeconomic Factors to the Unplanned Hospital Readmissions

Keivan Sadeghzadeh, Assistant Professor, University of Massachusetts Dartmouth, United States
Joohyun Chung, Assistant Professor, University of Massachusetts Dartmouth, United States
Soheil Sibdari, Associate Professor, University of Massachusetts Dartmouth, United States

Unplanned hospital readmission is common, expensive and often preventable so it is considered as a marker of poor healthcare system performance. Understanding the impact of socioeconomic factors on unplanned readmission is essential. This study provides an important value of reducing healthcare systems disparities to achieve more equitable healthcare outcomes.

093-1808 Optimizing Hospital-Wide Bed Allocation

Martin Copenhaver, Research Scientist and Lecturer, Massachusetts General Hospital and MIT, United States
Andrew Vanden Berg, Operations Research Analyst, Defense Logistics Agency, Department of Defense, United States
Ana Cecilia Zenteno Langle, Operations Research Manager, Massachusetts General Hospital, United States
Retsef Levi, Professor, MIT, United States
Peter Dunn, Vice President and Executive Medical Director, Massachusetts General Hospital, United States

The allocation of beds in a hospital to medical and surgical services is a central strategic decision for capacity management. In this talk, we will discuss the use of optimization and simulation models to design and implement a new bed allocation at Massachusetts General Hospital.

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Sunday, 04:30 PM - 06:00 PM, Columbia 5 Track: Healthcare Operations Management

Contributed Session: Operating room and appointment scheduling

Chair(s): Cansin Cagan Acarer

093-1007 A Volatility-Portfolio Approach to Scheduling Operating Rooms

Lauri Saarinen, Student, Universite De Lausanne, Switzerland

We apply a volatility portfolio theory to the scheduling of surgical operating rooms at a university hospital. Arriving patients are classified by urgency, with urgent surgeries allocated to available capacity each day. Less urgent surgeries are then scheduled in the remaining capacity. Throughput utilization increased and patient waiting time is decreased.

093-1828 Improvement of Performance Indicators in Hospitals: An Innovative Approach Through Computational Algorithm

João Junior, Associate Professor, Centro Universitário FEI, Brazil
Alfredo Da Silva Fernandes, Professor, Instituto do Coração, Brazil
Aline Barbosa Ribeiro, Student, Instituto do Coração, Brazil
Jorge Sagayama, Student, Centro Universitario FEI, Brazil
Aida Turquetto, Post Doc/Researcher, Instituto do Coração, Brazil

This work focus on the development of a computational algorithm optimization to solve the sequencing problem of cardiac elective surgeries. The objective was to reduce the waiting time for surgeries, as well as maximize the use of hospital resources, i.e., more patients without the need for investment in overtime payments.

093-0495 Scheduling Elective Surgeries in Multiple Operating Rooms

Cansin Cagan Acarer, Student, Brock University, Canada
Reena Yoogalingam, Associate Professor, Brock University, Canada

We consider the problem of designing appointment schedules in a multiple operating room surgery center. A simulation optimization approach is used to develop schedules for elective surgical procedures. We study the pooling of operating room resources as an option for improving resource utilization and performance.

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Sunday, 04:30 PM - 06:00 PM, Columbia 6 Track: Healthcare Operations Management

Contributed Session: Personalized medicine and chronic disease management

Chair(s): Brandon Lee

093-1939 Using Partially Observable Markov Decision Processes to Improve Alzheimers Disease Screening

Saeideh Mirghorbani, Student, Binghamton University, United States
Sharif Melouk, Associate Professor, The University of Alabama, United States
John Mittenthal, Associate Professor, The University of Alabama, United States

Genetics, high blood pressure, and diabetes are some of the factors that place individuals at a higher risk of developing Alzheimer's disease (AD). To manage this risk in people more susceptible to AD, we develop a partially observable Markov decision process model for individuals transitioning through different stages of AD.

093-0952 Learning Curve Effects in Precision Medicine: A Cost-Effectiveness Analysis of Patient's Choice

Yucheng Chen, Student, University of Connecticut, United States
Manuel Nunez, Associate Professor, University of Connecticut, United States

Precision medicine is a high-cost complex medical procedure that provides targeted treatments according to individual characteristics of each patient. We present a cost-effectiveness dynamic model to assess learning curve effects in cost reduction through interaction with centralized database repositories. We also examine different policies to maximize a system's social welfare.

093-0127 Data: The Cure for Sick Healthcare Systems or a Contributor to the Problems?

Olga Matthias, Professor, Sheffield Hallam University, United Kingdom
Steve Brown, Professor, Southampton University, United Kingdom
David Halsall, Senior Analytical Manager, NHS England, United Kingdom

Ageing populations, rising public expectations, and medical advances have created systemic problems in healthcare. Drawing on NHS Reference Cost Index data we analyze key performance indicators and ascertain that the plethora of data fails to provide the information needed to improve performance. We provide a pragmatic framework to address this.

093-0512 A Numerical Taxonomy of Stroke Patient Medical History: Implications for Operations Management

Brandon Lee, Assistant Professor, University of Dayton, United States
Aleda Roth, Professor, Clemson University, United States
Lawrence Fredendall, Professor, Clemson University, United States

This study describes a numerical taxonomy of stroke patients, which was developed with k-means cluster analysis methods, using 22 medical history variables. The patient sample comes from a stroke dataset of a tertiary referral hospital which includes 8531 patients over 8 years. We discuss implications of taxonomy for operational issues.

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Sunday, 04:30 PM - 06:00 PM, Columbia 7 Track: Supply Chain Management

Contributed Session: Supply Chain Management and Corporate Performance

Chair(s): Sangdo Choi

093-2228 Supply Base Overlap with Competitors and its Impact on Financial Performance

Hyojin Kim, Student, Yonsei University, South Korea
Daesik Hur, Professor, Yonsei University, South Korea

Based on a social network theory and transaction cost economics, this study redefines the concept of supply base overlap and investigates impacts of structural configurations of supply base overlap with competitors. This study empirically analyzes its impact on focal buying firm's financial performance using the global supply network data.

093-1410 Investigating the Relationship Between Structural and Operational Efficiencies and Firm Performance: A First-Tier Supplier's Perspective

Gyusuk Lee, Student, Michigan State University, United States
Sri Talluri, Professor, Michigan State University, United States

We investigate the impact of structural and operational efficiencies of first-tier suppliers in the automotive supply network on their performance. Our results show that both efficiencies are positively associated with firm performance. We also demonstrate the moderating role of operational efficiency on the relationship between structural efficiency and performance.

093-0286 Effect of Supply Network Structure on Firm's Mergers and Acquisitions

Wenjin Hu, Student, Zhejiang University, China
Yan Dong, Associate Professor, University of South Carolina, United States
Yongyi Shou, Professor, Zhejiang University, China

Our study explores the influence of firm's supply network structure on its merger and acquisition decisions. Based on empirical analysis, our study finds that supply chain network structure plays a significant facilitating role in focal firms' merger and acquisition activities.

093-0758 Is Operational Metric a Good Indicator of Financial Bankruptcy?

Sangdo Choi, Assistant Professor, Christopher Newport University, United States
Javier Mella, Assistant Professor, Christopher Newport University, United States

We investigative the relationships between operational performance measures (e.g., inventory turns, profit margin, cash-to-cash cycle) and financial performance, especially focusing on bankruptcy. The target firms include Kodak, Blockbuster, General Motors, and Toy's R Us.

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Sunday, 04:30 PM - 06:00 PM, Columbia 8 Track: Supply Chain Management

Contributed Session: Technology and Supply Chain Management

Chair(s): Debjit Roy

093-0766 Artificial Intelligence as an Enabler for Intelligent Network Decisions: Recommendations from Other Research Fields

Anna Trunk, Lecturer, Friedrich-Alexander Universitat Erlangen-Nurnberg, Germany

Although rarely analyzed, artificial intelligence is an enabler for intelligent decision-making in supply chain networks to integrate an increasing amount of crucial information. Based on a systematic literature review on its usage within other research fields, we analyze various perspectives and obstacles of its implementation to recommend application opportunities.

093-1354 Research on Organic Food Supply Chain Based on RFID Technology and Internet of Things

Ran Liu, Student, Southeast University, China

By analyzing the structure and working principle of RFID system and EPC and apply it to the organic food supply chain, constructs a hybrid algorithm of negotiation intelligent management model based on RFID technology, to mitigate the vulnerability of the supply chain. Found that the model can support on-demand configuration

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093-1964 Trust 4.0 – How Sensors Replace Trust in Buyer-Supplier Relationships – Or Do They?

Katharina Badenhausen, Student, Erasmus University Rotterdam, Netherlands
Merieke Stevens, Associate Professor, Erasmus University Rotterdam, Netherlands

Placing sensors on production machinery is an increasingly common practice. The appeal of real-time access to continuous data is clear. Less straightforward is how far-going visibility is managed between organizations. In a multiple-case study, we examine how the adoption of sensors influences –and is influenced by–buyer-supplier trust.

093-0981 Cybersecurity and the Supply Chain: Assessing Corporate Response to a New DoD Cybersecurity Mandate

Steve Melnyk, Professor, Michigan State University, United States

In 2016, the American DoD announced a new supply chain cybersecurity mandate. This study assesses how suppliers view cybersecurity and the factors effecting their compliance with this new mandate. Special attention is drawn to the problems created by small to medium sized firms.

093-1856 Dynamic Order Pick Strategies in a Human-Robot Collaborative Environment

Kaveh Azadeh, Student, Erasmus University Rotterdam, Netherlands
Debjit Roy, Associate Professor, Indian Institute of Management Ahmedabad, India
René De Koster, Professor, Rotterdam School of Management, Netherlands

In a human-robot collaborative pick environment, robots work alongside pickers to improve the pick efficiency by reducing the unproductive walking time. In this research, we develop a Markov-decision model to investigate how higher pick performance can be achieved with fixed resources and a dynamic pick strategy.

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Sunday, 04:30 PM - 06:00 PM, Columbia 9 Track: Behavioral Operations Management

Contributed Session: Behavioral Issues in Retailing and Inventory Management

Chair(s): Jing Luo

093-1312 The Impact of Online Reviews on Consumer Choice and Willingness to Pay

Mustafa Canbolat, Associate Professor, Suny Brockport, United States
Michael von Massow, Associate Professor, University of Guelph, Canada

Online pricing is an important element of hotel revenue management. We conduct a revealed preferences experiment to evaluate the impact of consumer reviews, both choice and willingness to pay, in an online purchase environment. Our approach uses real reviews and an actual choice.

093-0170 The Role of Emotions in Operations Management: An Experimental Analysis of Newsvendors

Santiago Forero, Student, Bauer College of Business, United States
Norman Johnson, Professor, C.T. Bauer College of Business, United States
David Peng, Associate Professor, University of Houston, United States

The influence of emotions on judgment and decision making has received the attention of researchers in several fields, but it has received scant attention in operations management. We conduct a series of experiments to explore how a negative, cognitive-based emotion, impacts ordering decisions made by newsvendors.

093-0773 The Influence of Incentives on Sales and Operations Planning

Jose Benedicto Duhaylongsod, Student, Essec Business School, France
Felix Papier, Professor, Essec Business School, France
Ayse Onculer, Professor, Essec Business School, France

We analyze how incentives influence demand forecasting in sales and operations planning. Using a game-theoretic model and lab experiments, we investigate effort investments and forecast quality of planners who invest effort to observe private forecast information. We determine the role of effort and lying aversion on performance and collaboration.

093-1067 The Effects of Mental Accounting on Project Management and Performance

Manel Baucells, Professor, University of Virginia, United States
Yael Grushka-Cockayne, Assistant Professor, Darden School of Business, United States
Woonam Hwang, Assistant Professor, Hec Paris, France

Project managers compare ongoing costs and scope to a baseline reference plan. We develop a stylized model capturing the dynamics of this process, and investigate the impact of loss aversion, reference-point updating, and narrow framing on a project manager's decisions and the project's financial performance.

093-2053 Learning Behavior From a New Market

Jing Luo, Student, University of Pittsburgh, United States

Our goal is to look at the behavior of the business. With a potential market out there, how do businesses learn about the new market by providing a discounted price or just information and then decide whether they are going to stay within this market or not.

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Sunday, 04:30 PM - 06:00 PM, Columbia 10 Track: Product Innovation and Technology Management

Contributed Session: Technology & Innovation Management across Platforms & Ecosystems

Chair(s): Kayvan Lavassani

093-1208 Study on the Policy Protection Space for Disruptive Technology from the Perspective of SNM Theory

Ziyang Huang, Student, Huazhong University of Science & Technology, China

The government generally supports the development of disruptive technologies by issuing various policies. This paper constructs a two-dimensional model for analyzing the policy protection space of disruptive technology based on strategic niche management theory. Finally, it takes new energy vehicle industry as an example to verify that the model is effective.

093-1777 Plant Locations, Strategic Alliances, and Knowledge Spillover Patterns

Hiroki Sano, Associate Professor, Ritsumeikan University, Japan

Manufacturing firms differ in terms of strategic choices of their plant locations. This research examines how diversification of plant locations affects knowledge spillover patterns between firms. By analyzing industry data, we discuss firms' decisions on technological alliances and plant locations in the semiconductor industry.

093-2069 Firm's Position in Business Ecosystem and its Effect on Performance: An Empirical Networks Analysis Study

Kayvan Lavassani, Associate Professor, North Carolina Central University, United States
Bahar Movahedi, Assistant Professor, North Carolina Central University, United States

Advancements in the study of complex systems provide fruitful opportunities to investigate organizational operations and activities across an interconnected network of firms. This empirical study explores how the firms' network position and influence affects different aspects of organizational performance. The utilized methodology and analysis techniques can be applied to other industries.

521

Sunday, 04:30 PM - 06:00 PM, Columbia 11 Track: Inventory Management

Contributed Session: Inventory Management and Finance/Marketing Interface

Chair(s): Gonçalo Figueira

093-1464 The Disruptive Newsvendor

Myles Garvey, Assistant Professor, William Paterson University, United States
Steven Carnovale, Assistant Professor, Rochester Institute of Technology, United States

Newsvendor models have assumed that consequences of inventory policy mainly affect either the focal firm or those within a few tiers. In this research, we explore the effects of newsvendor policies on entire supply networks and argue that local and global network propagated costs should be considered.

093-1169 Multiple Renewable Energy Portfolio Investment

wei chen, Student, niversity of Electronic Science and Technology of China, China
yongkai ma, Professor, University of Electronic Science and Technology of China, China
xiaowo tang, Professor, University of Electronic Science and Technology of China, China

Renewable energy sources that have a property of low carbon emissions possess intermittency, which reduces possibility of electricity on-grid. However, multiple renewable energy portfolio grid-connected can increase the on-grid rate. Some interesting results were obtained in this paper.

093-2085 The Benefits of Selling Opaque Products in Perishable Inventory Systems

Katsunobu Sasanuma, Assistant Professor, Stony Brook University, United States

Opaque products are sold online at a discount price without certain product specifications. They are known to make the operation of non-perishable products efficient. In this presentation we evaluate the impact of opaque products on the total operational cost in a perishable inventory system using simulations and analytical models.

093-0377 The Impact of Committing to Customer Orders in Online Retail

Gonçalo Figueira, Assistant Professor, INESC TEC and Faculty of Engineering, UP, Portugal
Willem Jaarsveld, Van, Assistant Professor, tu/e, Netherlands
Pedro Amorim, Assistant Professor, INESC TEC and Faculty of Engineering, UP, Portugal
Jan Fransoo, Professor, Kuehne Logistics University, Germany

We study the underlying inventory management problem in online retail where customers place orders for a future due date. We show, both analytically and numerically, the impact of committing to orders on a service level performance, as well as on other customer satisfaction dimensions, such as fairness and provided features.

522

Sunday, 04:30 PM - 06:00 PM, Columbia 12 Track: Service Operations

Contributed Session: Multi-stage E-service Delivery

Chair(s): Amit Sachan

093-1532 Impact of Different Stages of E-Service Delivery Process on the Customer Satisfaction

PIYUSH GUPTA, Student, Indian Institute of Management Ranchi, India
Amit Sachan, Associate Professor, Indian Institute of Management Ranchi, India

This study aims to understand the impact of different stages of the perceived e-service delivery process (i.e., perceived searching, perceived ordering, perceived fulfillment, and perceived after-sales service process) on online customer satisfaction mediated by antecedent's variables of customer satisfaction considering service value, perceived control, perceived flexibility, and perceived risk.

093-1580 Mediating Attitude Between Relationship of Customer's Belief About E-Service Delivery Process and Intention

PIYUSH GUPTA, Student, Indian Institute of Management Ranchi, India
Amit Sachan, Associate Professor, Indian Institute of Management Ranchi, India

The objective of this study is to see the mediation of attitude towards service provider in the relationship between belief (i.e., perceived usefulness, perceived ease of use, perceived flexibility, perceived control, and perceived risk) about e-service delivery process of service provider and intention towards service provider.

093-1540 Customer-Oriented Performance Evaluation of Online Retailers Based on Perceived E-Service Delivery Process as a Measure

PIYUSH GUPTA, Student, Indian Institute of Management Ranchi, India
Amit Sachan, Associate Professor, Indian Institute of Management Ranchi, India

The aim of this study is to evaluate customer-oriented performance of different online retailers based on different stages of perceived e-service delivery process. TOPSIS is used as a technique to rank different online retailers based on perceived e-service delivery process as a performance measure.

093-1575 Mediating Attitude Between Customer's Belief of Different Stages of E-Service Delivery Process and Intention Relationship

Amit Sachan, Associate Professor, Indian Institute of Management Ranchi, India
PIYUSH GUPTA, Student, Indian Institute of Management Ranchi, India

The objective of this study is to see the mediation effect of attitude towards a service provider in the relationship between a customer's belief of different stages of perceived e-service delivery process (i.e., perceived searching, perceived ordering, perceived fulfillment, and perceived after-sales service process) and intention towards the service provider.

093-1546 Impact of Customer-Perceived Multi-Stage E-Service Delivery Process on the Customer Satisfaction

Amit Sachan, Associate Professor, Indian Institute of Management Ranchi, India
PIYUSH GUPTA, Student, Indian Institute of Management Ranchi, India

This study aims to see the impact of customer-perceived multi-stage e-service delivery process on customer satisfaction. This study uses regression to see the causal relationship between customer satisfaction (dependent variable) and process parameters of different stages of e-service delivery such as perceived searching, ordering, fulfillment and after-sales service process (independent variables).

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Sunday, 04:30 PM - 06:00 PM, Monroe Track: Humanitarian Operations and Crisis Management

Contributed Session: Improving Understanding of Humanitarian Operations

Chair(s): Fakulie Jawara

093-0300 A Framework for the Strategic Alignment of Humanitarian Response and Recovery Efforts

Kalyn Howard, Student, Air Force Institute of Technology, United States
Timothy Breitbach, Assistant Professor, Air Force Institute of Technology, United States

This study aims to develop and validate a framework for the strategic alignment of post-disaster humanitarian response activities with long-term recovery and development goals. We systematically review a variety of written sources authored by military and civilian organizations, and validate with expert interviews.

093-1122 Explaining the Inability to Prevent Disruption/Disaster

Willard Price, Emeritus Professor, University of the Pacific, United States

The author is amazed, even angered, about our inability to prevent system failures with significant negative consequences - on people, property, infrastructure, economies. This research prepares an academic reader with frameworks, cases, and exercises for students. The goal is to redirect system investments to optimize total prevention and response costs.

093-1967 Classification Model for Humanitarian Projects

Renata Anderson, Lecturer, Northern Kentucky University Highland Heights, United States
Felipe Buzanovsky, Student, Politecnico de Milano, Italy

The purpose of this article is to use an empirical-based approach to build a new classification model for humanitarian projects that reflects their objectives, activities, challenges, and human resources. 30 in-depth interviews with humanitarian workers were conducted. The data analysis proposes a set of three types of projects.

093-1674 Improving Farmers Performance Using Mobile Phone Information in Emerging Economies

Fakulie Jawara, Student, KUBS, South Korea
Hojung Shin, Professor, Korea University, South Korea

Farmers in low-income economies grapple with low productivity due to insufficient infrastructure. With the introduction of mobile phones- providing low access to information-we investigate its impact on price dispersion across markets and its link to farmers searching cost and waste reduction.

524

Sunday, 04:30 PM - 06:00 PM, Lincoln East Track: Humanitarian Operations and Crisis Management

Contributed Session: Humanitarian Operations in Latin America (2)

Chair(s): Irineu Brito Jr

093-1818 Logistics Challenges During the 2018 Vichada Floods in Colombia: Findings From Field Research

Feizar Rueda-Velasco, Student, Universidad Nacional De Colombia, Colombia
Miguel Jaller, Assistant Professor, University of California Davis, United States
Wilson Adarme, Professor, Universidad Nacional De Colombia, Colombia
Samantha Garzon, Student, ????, Colombia

Floods are the most frequent disaster in Colombia. This presentation discusses logistics challenges identified during the field research after the floods in the Vichada State. The research showed how the priority rules used for aid allocation and to access difficulties of the impacted area affected the humanitarian response.

093-2070 Risk Assessment in the Magdalena Market

Irineu Brito Jr, Professor, Universidade Estadual Paulista Julio De Mesquita Filho - Unesp, Brazil
Mario Chong, Professor, Universidad del Pacífico, Peru
Juan Lazo, Professor, Universidad del Pacífico, Peru
Gabriela Maravi, Assistant Professor, Universidad del Pacífico, Peru

This study evaluates the risk of disaster in the Peruvian Market; providing information to the entities in charge of security and contingency plans. Pedestrian mobility and last mile studies are used in order to determine the levels of risk that affect pedestrians. The results show a risk map to help decision-makers.

093-2074 Strategic Distribution of Humanitarian Aid Assets in Callao

Irineu Brito Jr, Professor, Universidade Estadual Paulista Julio De Mesquita Filho - Unesp, Brazil
Mario Chong, Professor, Universidad del Pacífico, Peru
Juan Lazo, Professor, Universidad del Pacífico, Peru
Gabriela Maravi, Assistant Professor, Universidad del Pacífico, Peru

This study identifies the optimal location of the humanitarian aid stores in Callao, a district located in the center-west of Peru. In order to achieve this, Callao responses its capacity by natural disasters. The criteria such as distance from the sea, population density, victims, strategic points, and road infrastructure are analyzed.

525

Sunday, 04:30 PM - 06:00 PM, Lincoln West Track: Empirical Research in Operations Management

Invited Session: Behavioral Issues in Service Operations

Chair(s): Qiuping Yu

093-0203 Making the Wait Worthwhile: Experiments on the Effect of Queueing and Consumption

Sezer Ulku, Associate Professor, Georgetown University, United States
Chris Hydock, Post Doc/Researcher, MSB, United States
Shiliang Cui, Assistant Professor, Georgetown University, United States

We conduct a series of experiments to study how the time spent waiting in line affects consumption decisions and find that purchase quantity increases with waiting time. We identify mental accounting for sunk costs as the underlying mechanism and show that commonly employed managerial practices can lower consumption.

093-0616 Man vs Machine in Retail Assortment Planning

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

In this study we examine the output from an assortment planning system, manager overrides of those outputs, and their profit implications. We examine the implications of following recommendations from man versus machine for products at different stages in the lifecycle using a field experiment.

093-2080 Optimizing Services in Retail Networks Using High-Dimensional Panel Data

Gad Allon, Professor, The Wharton School, United States
Ken Moon, Assistant Professor, The Wharton School, United States
Amandeep Singh, Student, The Wharton School, United States

We study how retail stores' multi-dimensioned service levels affect consumers' buying behavior in spatial markets. To this end, we propose the Double Block-Lasso BLP estimator under mild assumptions of structural stability and sparsity. Using the estimated influence structure, we highlight service quality interventions impacting consumers' buying patterns.

093-0655 Linking Abandonment, Service Request, and Staffing in Service Systems: A Behavioral Perspective

Qiuping Yu, Assistant Professor, Indiana University, United States
Eric Webb, Assistant Professor, University of Cincinnati, United States
Kurt Bretthauer, Professor, Indiana University, United States

Using field data from a bank's call center, we study customers' reference-dependent behavior in time in the presence of delayed announcements. We are particularly interested in how spending longer or shorter than expected when awaiting service affects customer abandonment behavior and service requirement decisions in service systems.

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Sunday, 04:30 PM - 06:00 PM, Jefferson West Track: Supply Chain Risk Management

Invited Session: Tutorial: Financial markets, demand risk, and offshoring decisions

Chair(s): Yulan Wang Mengshi Lu

093-2403 Financial Markets, Demand Risk, and Offshoring Decisions

Sridhar Seshadri, Professor, University of Illinois Urbana-Champaign, United States
Nikolay Osadchiy, Associate Professor, Emory University, United States

We present results regarding the relationship between financial markets and demand in real markets. We shall cover how to model risk propagation through supply networks and test the risk models using empirical data. We then use the same framework to provide results on how financial markets affect global outsourcing decisions.

528

Sunday, 04:30 PM - 06:00 PM, Georgetown East Track: Supply Chain Risk Management

Invited Session: Managing Disruption and Operational Risk

Chair(s): Hubert Pun Salar Ghamat

093-0240 Mitigating Product Shortages due to Disruptions in Assembly and Distribution Supply Chains

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

We study assembly and distribution supply chains subject to disruptions. We show that in assembly and distribution supply chains, it tends to be optimal to hold risk mitigation inventory rather downstream than upstream. Reserve capacity tends to be held upstream in assembly SCs and downstream in distribution SCs.

093-0338 Supply Management and Supply Risk

Gokce Esenduran, Assistant Professor, Purdue University, United States
John Gray, Associate Professor, Ohio State University, United States
Burcu Tan Erciyes, Assistant Professor, University of New Mexico, United States

In this paper, we examine whether, when, and how common supply chain risk management practices affect the realized supply risk. We employ system dynamics modeling with realistic parameters to illustrate situations where certain practices can inadvertently increase supply risk.

093-0544 Optimal Pricing Under Customer Return Risk

Xiangjing Chen, Student, W.P. Carey School of Business, United States
Yimin Wang, Assistant Professor, Arizona State University Tempe, United States

We analyze a manufacturer's pricing strategy when customers' evaluation of product features is uncertain. Customers' propensity to return the product depends on the realized fit of product features and the price paid. We offer insights on how the risk of product returns influence the optimal pricing strategy.

093-0599 Operational Risk Management: Team Based Incentive Bonus and Effort Coupling

Yuqian Xu, Assistant Professor, University of Illinois Urbana-Champaign, United States
Lingjiong Zhu, Assistant Professor, Florida State University, United States

We consider a financial firm that offers bonus to its employees as incentives to reduce operational risk losses. We characterize the optimal incentive bonus based on a team of employees and then explore the impact of team characteristics and effort coupling among team members on the optimal bonus.

093-0096 Burden of Information: A Capacitated Supplier Encroaches on a Less Informed Buyer

Hamid Elahi, Student, University of Western Ontario, Canada
Hubert Pun, Associate Professor, University of Western Ontario, Canada
Salar Ghamat, Assistant Professor, Lazaridis School of Business & Economics, Canada

We use a game-theoretical model to study supplier encroachment risk in a channel-conflict environment where a supplier has private information about its capacity. We show analytically that (1) the supplier may prefer to sell to a better-informed buyer, but (2) the buyer may be reluctant to develop advanced informational capabilities.

529

Sunday, 04:30 PM - 06:00 PM, Georgetown West Track: Teaching/Pedagogy in POM

Contributed Session: Effective Teaching in POM Courses

Chair(s): Naveed Ahmed Khan

093-1442 Integrating Behavioral Concepts and Organizational Design Issues into the MBA OM 'Core' Course

Joel Goldhar, Professor, Stuart School of Business Administration, United States
Susanna Aguilar, Post Doc/Researcher, Center for Corporate Performance, Stuart School of business, IIT, United States
Matt Lauritsen, Student, Institute of Psychology, United States

As operations becomes increasingly more complex and more services based, Operations Managers need greater awareness of the human and social issues that impact productivity. We offer suggestions of specific behavioral concepts and models useful to Operations Managers and a sample syllabus.

093-1954 Engaging Classroom Discussions with High Quality Guest Speakers: Strategies for Rural Colleges

Gihan Edirisinghe, Student, Washington State University Pullman, United States
Sachinthani Pathirana, Student, Washington State University Pullman, United States
Charles Munson, Professor, Washington State University Pullman, United States

Attracting high quality industry guest speakers for engaging classroom discussions on a regular basis is a challenging task for rural colleges due to location and cost constraints. We present successfully implemented strategies in achieving this using alumni guest speakers and free tools like LinkedIn, Google Forms, Google Sheets and Skype.

093-0539 Your Friend and Mine, Sweet Serpentine – Tips for Teaching Waiting Line Analysis

Keith Willoughby, Professor, University of Saskatchewan, Canada

Waiting line analysis is a fundamental subject taught within our OM courses. However, students may approach this topic with a blend of fear and loathing. We report on the use of news stories, spreadsheet models, and images that can capture, maintain, and heighten student interest in this material.

093-0113 Issues in Supply Chain Program Curriculum

Naveed Ahmed Khan, Lecturer, King Fahad University of Petroleum & Minerals, Saudi Arabia

Curriculum plays an imperative part for delivery of quality education in higher education programs. However, the debate on curriculum development has always been a central point over the decades. The research carried out in this regard reveals that SCM programs need serious revamping to make them more logical and robust.

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Sunday, 04:30 PM - 06:00 PM, Cabinet Track: Sustainable Operations

Contributed Session: Sustainability and Supply Chain Networks

Chair(s): Chokdee Siawsolit

093-0358 Exploring the Relationship Between Sustainability and Supplier Viability at the Bottom of the Pyramid

Anton Shevchenko, Assistant Professor, Concordia University, Canada
Xiaodan Pan, Assistant Professor, Concordia University, Canada
Goran Calic, Assistant Professor, Mcmaster University, Canada

It remains unclear how environmental sustainability initiatives affect bottom-of-the-pyramid suppliers. We use a comprehensive data set from a micro-lending platform to investigate how environmental sustainability initiatives affect the need of bottom-of-the-pyramid suppliers to seek additional resources to finance their operations and whether such initiatives affect their viability.

093-0820 Sustainability Through Redesign and Optimization of Food Supply Chain

Ramesh Krishnan, Student, Indian Institute of Technology Madras, India
Arshinder Kaur, Associate Professor, Indian Institute of Technology Madras, India
Renu Agarwal, Associate Professor, University of Technology Sydney, Australia

Our intent in this study is twofold: firstly, redesign the food supply chain and secondly develop an optimization model to find the optimal configuration of the redesigned food supply chain network elements to maximize the economic and social benefit and minimize the environmental impact.

093-0345 Reducing Food Waste at Grocery Stores Through Omni-Channel Retailing

Chokdee Siawsolit, Student, Drucker School of Management, United States
Gary Gaukler, Associate Professor, Drucker School of Management, United States

An estimated $2,400 worth of products are discarded daily per grocery store. Using an MDP-based inventory model, we compare and contrast two methods of acquiring demand information, namely, allowing advance order placements, and allowing order placements on out-of-stock items in their abilities to reduce product outdating at the retail location.

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Sunday, 04:30 PM - 06:00 PM, Intl Ballroom East Track: Supply Chain Analytics

Invited Session: Data Driven Supply Chain Management

Chair(s): Yimin Yu

093-0990 Optimal Dynamic Salesforce Compensation with Learning

Lina Bao, Post Doc/Researcher, Zhejiang University, China
Xiangyin Kong, Student, City University of Hong Kong, China
Yimin Yu, Associate Professor, City University of Hong Kong, Hong Kong

We consider agent ability uncertainty in a simple dynamic model and study optimal dynamic contracting with Bayesian learning. Under a multi-period setting, the agent's shirking potentially reduces the current output and increases expected agent ability due to the belief of calibration under the Bayesian rule.

093-1025 Demand Management and Inventory Control for Substitutable Products

Xiaobei Shen, Associate Professor, Univ Sci & Technol China, China
Jeannette Song, Professor, Duke University Durham, United States
Zhengliang Xue, Research Staff Member, IBM, United States

This paper studies dynamic inventory and pricing decisions for a set of substitutable products over a finite planning horizon. We present a general stochastic, price-dependent demand model that unifies many commonly used demand models in the literature. We characterize the optimal policy and develop heuristic algorithms to compute it.

093-1030 Labour Market and Supply Chains - An NLP Approach on Online Job-Postings

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The labor input heterogeneity has long been overlooked in the product and service markets linked through supply chains. We construct a time-varying network of labor market skillset demand for US companies. We study the labor market implication on different positions of supply chains as well as industry competitors.

093-1258 Optimize Assortment Selection for a Front-End Warehouse

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Proper assortment for a front-end warehouse is critical to improve order fulfilment rate and response speed as well as to reduce fulfilment cost. We investigate a data-driven approach to optimize the assortment selection.
