

Sessions for Friday, April 20

Friday, 09:15 AM - 10:45 AM

Friday, 09:15 AM - 10:45 AM, Scottsdale (Floor 5)

Track: Behavioral Operations

Session: Bounded Rationality and System Dynamics in OM

Chair(s): Maximiliano Udenio

025-0918 Managing the Dynamics of Process Improvement: Production, Improvement, and Learning

Brad Morrison, Assistant Professor, Brandeis International Business School, United States

Using a system dynamics model of process improvement under constrained resources that must do both production and process improvement, simulation analysis highlights the tradeoff between production and improvement and demonstrates a tipping point that demarcates enduring high production levels. Results show that policies that favor learning lead to superior performance.

025-1320 Regulatory Systems and Loss Aversion in Newsvendor Model

Xiang Zhang, Associate Professor, Beijing Institute Of Technology, China

We propose a behavioral model to predict judgmental and decision making behavior by incorporating loss aversion and regulatory orientations in newsvendor framework. The proposed model shows that both the optimal order quantity and profit are substantially influenced by the bounded rationality and regulatory orientations.

025-1291 Cultural dimensions of agile supply chain management

Diego Fogaça, Student, Universidade De Sao Paulo, Brazil

Fernando Almada Santos, Assistant Professor, Universidade De Sao Paulo, Brazil

Rafael Souza, Student, Universidade De Sao Paulo, Brazil

Raul Toledo, Student, Universidade De Sao Paulo, Brazil

Marcos Gandra, Student, Universidade De Sao Paulo, Brazil

This paper investigates the relationships between Hofstede's cultural dimensions and agile supply chain management. These concepts have their main characteristics presented. The conclusions are that the agile supply chain management is related to the following cultural dimensions: low power distance, collectivism, low uncertainty avoidance, femininity and long term orientation.

025-0618 The Impact of Bounded Rationality on the Revenue Sharing Contract Decisions

Ehsan Elahi, Assistant Professor, University Of Massachusetts Boston, United States

Chinthana Ramaswamy, Student, University Of Massachusetts Boston, United States

This research uses experimental approach to investigate the reasons behind the deviation of decision makers from choosing optimal values in the context of supply chain contracts. Specifically, we explore the role of bounded rationality on the order size placed by a retailer to its supplier in a revenue sharing contract.

025-1817 An analysis of the effect of response speed on the bullwhip effect using control theory

Maximiliano Udenio, Student, Technische Universiteit Eindhoven, Netherlands

Jan Fransoo, Professor, Eindhoven University of Technology, Netherlands

We use transfer functions to analyze the effect of inventory policies on non-stationary performance. We extend earlier research by explicitly modeling decision makers' reaction times and supply line weighing. We gather additional insights to our previous studies on the BWE and upstream demand evolution.

Friday, 09:15 AM - 10:45 AM, Lincolnshire II (Floor 6)

Track: Empirical Research in OM

Session: Empirical Research on Firm Performance

Chair(s): Amrou Awaysheh

025-0020 The Relationship of Financial and Inventory Performance of Manufacturing Firms in Indian Context

Jigyasu Gaur, Student, University Of Memphis, United States

Sourabh Bhattacharya, Associate Professor, IMT, India

We examine the relationship between the discrete components of inventory, namely, Raw material inventory, Work-in-progress inventory, and Finished goods inventory, and financial performance of Indian manufacturing firms. The results of our study indicate that Finished goods inventory is the most important decisive factor for Indian Manufacturing firms.

025-1256 Inventory Decisions and the Financial Performance of the Firm

Ralf Seifert, Professor, IMD, EPFL, Switzerland

Olov Isaksson, Student, EPFL, Switzerland

We examine the financial consequences that inventory decisions have on firm performance. First, we investigate how controlling for endogeneity affects our results. Secondly, we explore the heterogeneity between the three inventory components - RM, WIP and FG. Thirdly, we examine the robustness of our results over a 29-year period.

025-0507 Empirical investigation of strategic agility and its impact on operational and firm performance

Hojung Shin, Associate Professor, Korea University, Korea, Republic of (South Korea)

Jae-Nam Lee, Associate Professor, Korea University, Korea, Republic of (South Korea)

Hosun Rhim, Professor, Korea University, Korea, Republic of (South Korea)

DaeSoo Kim, Professor, Korea University, Korea, Republic of (South Korea)

This study empirically explores the relationships among strategic agility, operational performance (responsiveness), and firm performance (customer retention and financial performance) from the dynamic capabilities perspective. Using structural equation modeling, we perform confirmatory analyses to test the hypothesized associations in the structural models. We discuss findings, managerial implications and theoretical contribution.

025-1749 The Impact of Socially Responsible Practices on Firm Performance

Amrou Awaysheh, Assistant Professor, Instituto De Empresa, Spain

This paper examines the relationship between the announcement of socially responsible practices (SRP) and the stock market response to these practices. Empirical results show that there is a significant positive return associated with the announcement of SRP, and a significant negative return associated with negative SRP.

☞	Friday, 09:15 AM - 10:45 AM, Ohio State (Floor 6) Session: Empirical Research II Chair(s): Marly Carvalho Alvaro Gehlen de Leao	Track: Empirical Research in OM
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025-1282 Can Hot-Hand Prevail in Lottery Games? Theory, Evidence, and Applications

Qingxia Kong, Student, National University Of Singapore, Singapore
 Nicolas Lambert, Assistant Professor, Stanford University, United States
 Chung-Piaw Teo, Professor, National University Of Singapore, Singapore

In this paper, we investigate how game designs shapes customers' perceptions of randomness. We create a simple economic setting in which a sequence of random outcomes are generated and build a Bayesian Updating model to explore conditions under which the Hot-hand Fallacy appears.

025-0870 Paradigm: a bibliometric analysis of papers presented at the POMS's Conference in the period 2000 to 2011

Joao Santos, Professor, Universidade Metodista De Sao Paulo, Brazil
 Jose Massaroppe, Professor, Universidade Metodista De Sao Paulo, Brazil
 José Claro, Professor, Universidade Metodista De Sao Paulo, Brazil

Shows on bibliometrics paradigm in papers presented at POMS 2000 to 2011, establishes the profile of the authors and the relationships contained in its theoretical content. We used the portal of the POMS and the abstracts contained in each of the events of the period, seeking to highlight the concept.

025-1422 A vision of effective use of IT in supporting SCM firms in the region of Sao Bernardo do Campo, Brazil

Clovis Galdino, Student, Universidade Metodista De Sao Paulo, Brazil
 Joao Santos, Professor, Universidade Metodista De Sao Paulo, Brazil
 Dagmar De Castro, Professor, Universidade Metodista De Sao Paulo, Brazil

The adopted was a field survey then collected data show that the determinative factors of better competitive environment positioning and SCM best practices was reached by enterprises that got better understanding such variables with introduction and maintenance of practices of Competitive Intelligence through the environmental scanning coming from several sources.

025-1605 LABICIN: a social responsible initiative to provide competitive intelligence for Brazilian companies

Alvaro Gehlen de Leao, Professor, Pontifical Catholic University Of Rio Grande Do Sul, Brazil
 Danielle Pozzo, Student, Pontifical Catholic University Of Rio Grande Do Sul, Brazil
 Sandro Ce, Professor, Pontifical Catholic University Of Rio Grande Do Sul, Brazil
 Marina Finestralli, M.Sc., Federation of Industries of the State of Rio Grande do Sul, Brazil

LABICIN, a University-Industry project with a social responsible perspective, is a pioneer initiative to produce researches under the concept of international competitive intelligence for companies looking for expansion in foreign markets. Besides, this partnership has also provided a valuable opportunity for undergraduate students to gain professional experience during their studies.

☜	Friday, 09:15 AM - 10:45 AM, Purdue (Floor 6) Session: Application of OM-Marketing Models Chair(s): Ozden Gur Ali	Track: Marketing and OM Interface
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025-0156 Developing the Interface between Purchasing and Marketing in French SMEs: Specific Stages and Challenges

Calin Gurau, Associate Professor, Gscm -, France

This study investigates the development of a formal interface between marketing and purchasing functions in French SMEs, during firms' transition from survival to the growth stage in their organizational lifecycle. The findings reveal the specific stages and challenges of this process, by comparing two groups of manufacturing and distribution firms.

025-0563 Improved churn prediction and insights by more effective use of customer data: the case of private banking

Umut Ariturk, Student, Koc University, Turkey
 Ozden Gur Ali, Assistant Professor, Koc University, Turkey

Customer retention is an important component of CRM. Based on a case study we offer insights into the churn behavior of private banking customers including environmental factors. Further, we show that multiple observations per customer in the training data improve predictive performance by 50% compared to the common approach.

025-1562 Determinants of consumer buying decision of the ABC - Brazil

Joao Santos, Student, Universidade Metodista De Sao Paulo, Brazil
 Wanderlei De Paulo, Professor, Universidade Metodista De Sao Paulo, Brazil

The survey was carried out between 12 and 27 November to identify the determinants of consumer buying decision of the ABC for Christmas, the equivalent to a strong influence on consumer decisions and more extra receipts in the month of December.

025-0700 Factors influencing prices in the mobile apps' store distribution model: An empirical study

Paolo Roma, Assistant Professor, Universita Degli Studi Di Palermo, Italy
 Giovanni Perrone, Professor, Universita Degli Studi Di Palermo, Italy
 Salvatore Giardina, Student, Universita Degli Studi Di Palermo, Italy
 Ciro Antonio Enea, Student, Universita Degli Studi Di Palermo, Italy

Mobile apps are expected to generate \$38 billion by 2015. With a growing number of app stores and devices, developers try to catch new business opportunities. However, apps' pricing has become a critical issue. Based on data collected from major app stores, this study explores the factors influencing apps' price.

025-1358 A Sequential Location and Pricing Model for a Duopoly in the Chinese Pharmaceutical Market

Yue Zhang, Assistant Professor, University Of Toledo, United States
Bo Li, Student, University Of Toledo, United States

Motivated by the challenges and characteristics of Chinese pharmaceutical store management in terms of location and pricing, we present a sequential decision model for two pharmacies, which compete on a unit line market by selling an identical drug so as to maximize profits. Analytical solution and simulation results are discussed.

5	Friday, 09:15 AM - 10:45 AM, Great America II (Floor 6)	<i>Track:</i> OM Practice
	<i>Session:</i> OM Applications in Healthcare	
	<i>Chair(s):</i> Masha Shunko	

025-1208 Postponement Strategies in Pharmaceutical Supply Chains: An Evaluation of Costs and Benefits

Stephan Verhasselt, Student, Eth Zurich, Switzerland
Felix Friemann, Student, Eth Zurich, Switzerland

Due to increasing cost pressure and rising demand fluctuations, the application of postponement strategies becomes more and more attractive for pharmaceutical companies. This paper presents different concepts for postponement strategies in pharmaceutical supply chains and evaluates each concept critically with regard to resulting costs and benefits.

025-0250 A Location Problem for Trauma Centers and EMS Transportation Resources

Soo-Haeng Cho, Assistant Professor, Carnegie Mellon University, United States
John Turner, Assistant Professor, University Of California Irvine, United States
Hoon Jang, Student, Korea Advanced Institute of Science and Technology, Korea, Republic of (South Korea)
Taesik Lee, Assistant Professor, Korea Advanced Institute of Science and Technology, Korea, Republic of (South Korea)

Providing appropriate care to major injury patients requires such patients be transported to a Trauma Center within 60 minutes. We develop a model and novel solution method to simultaneously locate trauma centers and EMS transportation resources to better serve the citizens of the Republic of Korea.

025-0332 A New Triage System for Emergency Departments

Soroush Saghafian, Student, University Of Michigan Ann Arbor, United States
Wallace Hopp, Professor, University Of Michigan Ann Arbor, United States
Mark Van Oyen, Associate Professor, University Of Michigan Ann Arbor, United States
Jeffrey Desmond, Assistant Professor, University Of Michigan Ann Arbor, United States
Steven Kronick, Assistant Professor, University Of Michigan Ann Arbor, United States

We propose a new triage system for hospital emergency departments that incorporates patient complexity as well as urgency. Using a combination of analytic and simulation models calibrated with hospital data, we demonstrate that the new triage system can substantially improve both patient safety and operational efficiency in emergency departments.

025-0945 Appointment scheduling for patients' repeated visits in specialty care clinics

Vinayak Deshpande, Associate Professor, University Of North Carolina Chapel Hill, United States
George Shanthikumar, Professor, Purdue University, United States
Heejong Lim, Student, Purdue University, United States

Motivated by a project with a community hospital in Indiana, we analyze a capacity planning problem for healthcare services with 'series' patients, i.e., patients who are scheduled for a series of appointments. We formulate a stochastic dynamic problem to the service facility to match supply and demand.

6	Friday, 09:15 AM - 10:45 AM, Dupage (Floor 3)	<i>Track:</i> OM in Latin America and the Caribbean
	<i>Session:</i> OM Applications in Agriculture	
	<i>Chair(s):</i> Rene Villalobos	

025-1710 Mendeleev's table for innovating operations

Ricardo Palma, Professor, Universidad Nacional de Cuyo, Argentina

This paper explores the possibility to develop a tool similar to a Mendeleev's table that is based in the GRAI Method and TRIZ, that can let to find those hidden process that our operations need to innovate not only on product but also in operations itself.

025-1739 Determination of optimal levels of immigrant farm labor in the production of fresh vegetables

Rene Villalobos, Associate Professor, Arizona State University Tempe, United States
Christopher Wishon, Student, Arizona State University Tempe, United States
Nicholas Mason, Student, Arizona State University Tempe, United States
Hector Flores, Student, Arizona State University Tempe, United States

A common constraint in the determination of the size and the type of fresh vegetables to grow is the availability of local farm labor. We present a planning model that determines the number of workers needed at each stage of the growing season, including immigrant workers needed during the season.

025-1741 A robust optimization approach applied to scheduling sawmill operations

Sergio Maturana Valderrama, Professor, Pontificia Universidad Catolica De Chile, Chile
Mauricio Varas, Student, Pontificia Universidad Catolica De Chile, Chile

Sawmill scheduling is subject to much uncertainty. In addition to the demand, the supply is also uncertain. In order to deal with this uncertainty, a robust optimization approach is proposed and tested on a realistic problem.

025-1740 Design of the Supply Chain of Farm to School Programs: The case of Mexico

Rene Villalobos, Associate Professor, Arizona State University Tempe, United States
Erika Murgia, Consultant, TIS Consulting Group, Mexico
Gerardo Trevino, Associate Professor, Itesm, Mexico

Octavio Sanchez, Consultant, TIS Consulting, Mexico

Mexico has started an aggressive program to introduce healthy food to elementary schools. However, the current distribution systems are not adequate to meet the demand produced by this program. We present a planning model for the design of direct distribution systems of fresh food from the farms to the schools.

7	Friday, 09:15 AM - 10:45 AM, Ballroom A (Floor 5) Session: Sustainable Operations and Shareholder Value Chair(s): Brian Jacobs	<i>Track:</i> Sustainable Operations
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025-0206 Shareholder Value Effects of Voluntary Emissions Reductions
 Brian Jacobs, Assistant Professor, Michigan State University, United States

Empirical evidence has demonstrated that the stock market reacts negatively to firm announcements of voluntary emissions reductions. We perform a longitudinal study to examine the influence of contextual factors and whether they have changed over time.

025-0438 Lean operations, corporate social responsibility and shareholder wealth
 Saurabh Mishra, Assistant Professor, Mcgill University, Canada
 Sachin Modi, Assistant Professor, University Of Toledo, United States

Existing research provides limited insights into the shareholder value implications of focusing on lean operations and corporate social responsibility (CSR) under a common framework. We examine the relationships between lean operations, CSR, and idiosyncratic returns and risks of firms. Longitudinal analysis of secondary data provides some novel research implications.

025-0444 Voluntary Disclosures and the Firm-Value Effects of Carbon Emissions
 Rachna Prakash, Assistant Professor, Georgetown University, United States
 Sandra Vera-Muñoz, Associate Professor, University Of Notre Dame, United States
 Ella Mae Matsumura, Professor, University Of Wisconsin Madison, United States

Using carbon emissions data that S&P 500 firms disclosed voluntarily, we find a higher likelihood of carbon emission disclosures as the proportion of industry peer firm disclosers increases and for more environmentally proactive firms. We also find a negative association between carbon emission levels and firm value.

8	Friday, 09:15 AM - 10:45 AM, Denver (Floor 5) Session: Application of Sustainability in Operations Chair(s): Matteo Kalchschmidt	<i>Track:</i> Sustainable Operations
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025-0441 Exploring the relationship between quality management and environmental management initiatives
 Mark Pagell, Professor, York University, Canada
 Frank Wiengarten, Assistant Professor, Esade Business School, Spain

Environmental and quality management practices share many similarities and have been individually linked to operational performance. This paper explores the role of quality management in the environmental management - performance relationship to assess if quality management practices interact with environmental practices to drive operational performance; the results suggest that they do.

025-0214 The sustainability implementation in supply networks
 Jury Gualandris, Student, Universita Degli Studi Di Bergamo, Italy
 Matteo Kalchschmidt, Associate Professor, Universita Degli Studi Di Bergamo, Italy

Nowadays, growing attention was devoted to the sustainability of supply networks. This work investigates the role played by new driving factors (e.g., innovation capabilities, supply management capabilities) in influencing the sustainability implementation in supply networks. Literature review and ten multiple case studies were performed to build a new conceptual framework.

025-1085 Passing environmental requirements up the supply chain: Evidence for a green bullwhip effect
 Su-Yol Lee, Assistant Professor, Chonnam National University, Korea, Republic of (South Korea)
 Robert Klassen, Professor, University Of Western Ontario, Canada
 Andrea Furlan, Professor, University of Padova, Italy
 Andrea Vinelli, Professor, University of Padova, Italy

The bullwhip effect has long been recognized as a problem for managing variability in supply chains. Our in-depth case studies reveal similar concerns for environmental requirements. First, evolving demands for better performance are passed upstream through successive tiers. Second, a green bullwhip effect is created as expectations are amplified.

025-1573 Brazilian Agribusiness Industries Corporate Sustainability Evaluation
 Adriane de Queiroz, Assistant Professor, Universidade Federal de Mato Grosso do Sul (UFMS), Brazil
 Diogo Silva, Student, Universidade Federal de Mato Grosso do Sul (UFMS), Brazil
 Luis Pereira, Assistant Professor, Fundacao Getulio Vargas, Brazil

This research aims to evaluate corporate sustainability of Brazilian agribusiness industries. A preliminary index to assess corporate sustainability across industries was developed. Results show that sustainable practices are adopted by Brazilian agribusiness industries. The level of corporate sustainability is explained by the model of sustainability management they adopt.

11	Friday, 09:15 AM - 10:45 AM, Ballroom B (Floor 5) Session: Supply Chain Strategy Chair(s): Muhammad Shakeel Sadiq Jajja	<i>Track:</i> Supply Chain Management
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025-0161 The Impact of Supply Chain Strategy on Supplier Functions and Organizational Performance
 Muhammad Shakeel Sadiq Jajja, Student, Lahore University Of Management Sciences, Pakistan
 Syed Hassan, Professor, Lahore University Of Management Sciences, Pakistan
 Shaukat Brah, Professor, Al Ghurair University, United Arab Emirates

This paper bridges the gap in literature and presents a framework linking supply chain strategy and performance. The proposed framework explains how strategy impacts immediate supplier functions and subsequently performance. The research study tests the framework and finds support for a strong link between strategy, supplier function and performance.

025-0789 Variability in Supply Chains - Linking the OM-Triangle with SCM

Martin Poiger, Lecturer, University Of Applied Sciences Bfi Vienna, Austria

The OM-Triangle (Lovejoy, 1998) shows three possibilities to address uncertainty: safety inventory, safety capacity, or reducing variability. Variability in supply chains is analyzed within this conceptual study, leading to a framework organizing the different types of variability. Furthermore, concepts from supply chain management are linked to the OM triangle.

025-1233 A New Classification of Supply Chains Based on Resourced Based View in Automotive Industry

Carlos Cordon, Associate Professor, International Institute for Management Development, Switzerland
Javad Feiz Abadi, Assistant Professor, MISI, Malaysia

Most of the proposed configurations have been based on environmental factors and structure-conduct-performance approach. Exploring supply chain configuration with emphasis on supply chain resources and capabilities could be a logical addition to the mentioned configurations. In this paper, after a qualitative research analysis of the views of experts

025-0734 Analysis of the Supply Chain Governance from the Perspective of the Five Steps of Focusing - TOC

Douglas Veit, Student, UNISINOS, Brazil
Aline Dresch, Student, UNISINOS, Brazil
Ricardo Cassel, Associate Professor, UNISINOS, Brazil
Daniel Lacerda, Professor, UNISINOS, Brazil

This paper aims to analyze the supply chain governance from the perspective of the Theory of Constraints and the Five Steps of Focusing. It proposes that the supply chain governance could be seen as a constraint, and therefore the Five Focusing Steps should be applied to break this constraint.

025-1227 An investigation into the effectiveness of strategy theories in explaining supply chain performance using arch

Mahender Singh, Associate Professor, Massachusetts Institute Of Technology, United States
Javad Feiz Abadi, Assistant Professor, MISI, Malaysia
Carlos Cordon, Associate Professor, International Institute for Management Development, Switzerland

Supply chain is a fast maturing domain with a relatively brief history. In the supply chain literature, there are numerous articles dealing with the topic of supply chain strategy and strategic supply chain management. Despite the use of management theories in the past for supply chain management, which view is

12	<p>Friday, 09:15 AM - 10:45 AM, Houston (Floor 5)</p> <p><i>Session:</i> Green Supply Chains 2</p> <p><i>Chair(s):</i> Krishna Sundar Diatha</p>	<i>Track:</i> Supply Chain Management
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025-1269 An Econometric Analysis of Product Recall Strategies and Recall Effectiveness

Aleda Roth, Professor, Clemson University, United States
Manpreet Hora, Assistant Professor, Georgia Institute Of Technology, United States
Tracy Johnson-Hall, Student, Clemson University, United States

We study the role of supply chain characteristics and strategies adopted by firms during product recalls and their association with product shelf life. Using food and pharmaceutical recall data, we employ econometric methods to examine this association. We discuss our results and their implications to firms, consumers and policy-makers.

025-1293 Global Sales & Operations Planning as a Supply Chain Coordination Mechanism

Sang Ho Chae, Student, Yonsei University, Korea, Republic of (South Korea)
Daesik Hur, Associate Professor, Yonsei University, Korea, Republic of (South Korea)

This study employs a single case study of a multinational firm in consumer electronics industry to investigate how a multinational firm can effectively utilize its S&OP process as a supply chain coordination mechanism. Theoretical arguments are developed from the case analysis.

025-1210 Supply chain management of perishable items: A case of Indian mushroom growers

Suresh Bhagavatula, Assistant Professor, Indian Institute Of Management Bangalore, India
Rajluxmi Murthy, Associate Professor, Indian Institute Of Management Bangalore, India
Krishna Sundar Diatha, Associate Professor, Indian Institute Of Management Bangalore, India

This paper examines supply chain management of perishable items from the firm to the value chain level and seeks to develop propositions on determinants of different levels of success in entrepreneur driven value chains with reference to entrepreneurial clusters, specifically on collective efficiencies and joint actions of Indian mushroom entrepreneurs.

025-1325 The impact of trade facilitation initiatives on Brazilian logistics supply chain performance

Mônica Maria Luna, Associate Professor, Federal University Of Santa Catarina, Brazil
Carolina Luisa Vieira, Student, Universidade Federal De Santa Catarina, Brazil
Carlos Fries, Student, Federal University Of Santa Catarina, Brazil
Dmontier Aragão Júnior, Student, Universidade Federal De Santa Catarina, Brazil

A region's logistics performance is conditioned by its available transportation infrastructure, its companies' logistics competencies, and trade procedure related aspects. This paper presents a trade facilitation initiative classification based on the transaction cost theory. It shows results obtained in Brazil, highlighting the changing role of government in today's context.

025-1816 How to Create the Culture of the Lean Sustainable Supply Chain

Robert Palevich, Professor, Indiana University Purdue University Fort Wayne, United States

The session describes the corporate culture needed and the initial components of management and technology to create a world-class Lean and Green company. The process shows organizations how they can increasingly leverage complex, content-rich information environments to drive breakthrough cost reduction and environmental benefit.

13	<p>Friday, 09:15 AM - 10:45 AM, Watertower (Floor 10) <i>Track:</i> OM in Travel, Tourism, and Hospitality Industries</p> <p><i>Session:</i> The Intersection of Disaster Relief and Sustainability</p> <p><i>Chair(s):</i> Scott Young</p>
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025-1747 Panel Session: The Intersection of Disaster Relief and Sustainability

Scott Young, Professor, Depaul University, United States
 Nezih Altay, Associate Professor, Depaul University, United States
 Kanwalroop Dhanda, Associate Professor, Depaul University, United States
 Laura Birou, Associate Professor, Louisiana Tech University, United States

Disasters accentuate the need for logistical support of key scarce resources. They also strain the societal and welfare needs of the people who are impacted. This panel will discuss key issues in the long-term effects on sustainability caused by disasters.

14	<p>Friday, 09:15 AM - 10:45 AM, Ballroom F (Floor 5) <i>Track:</i> Product Innovation and Technology Management</p> <p><i>Session:</i> Open Innovation and Value Creation</p> <p><i>Chair(s):</i> Zoran Perunovic</p>
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025-0026 A framework for studying importance of open innovation in the maritime industry

Jelena Vidic-Perunovic, R&D Engineer, American Bureau of Shipping, United States
 Zoran Perunovic, Assistant Professor, Technical University Of Denmark, Denmark

The industry leaders require from maritime organizations to open up their innovation processes. The question is if the industry is ready for that? In this paper we theorize about that possibility and develop a framework for studying the importance and relevance of open innovation for the maritime industry.

025-0825 Innovation (product and process) and value creation in Brazilian firms

Leonardo Basso, Senior Lecturer, Universidade Presbiteriana Mackenzie - São Paulo, Brazil
 Herbert Kimura, Associate Professor, Universidade Presbiteriana Mackenzie - Sao Paulo, Brazil
 Ullisses Shimizu, Student, Universidade Presbiteriana Mackenzie - Sao Paulo, Brazil

We verified the relationship between innovation investment (innovative capacity, human relationship capital and innovative effort) and value creation in Brazilian firms. Based on the PINTEC/IBGE survey, which uses the Oslo manual methodology and other complementary databases, through factor analysis, linear correlation and structural equation model, the tested hypotheses were confirmed.

025-1226 Difficulties and problems with the innovation process in academia

Paula Martins, Student, Universidade Federal De Juiz De Fora, Brazil
 Thais Ferraz, Professor, Universidade Federal de Itajubá, Brazil
 Luiz Alves, Professor, Universidade Federal De Juiz De Fora, Brazil

The innovation process is notoriously complex and involves many risks and uncertainties, particularly in science, where the problems of innovation development are engaged. This work presents the main difficulties Brazilian academic researchers face in this process, proposing ways to overcome them.

025-1361 A Brief Review of Models for Technology Transfer

Ronaldo da Silva, Student, Universidade Nove De Julho, Brazil
 Wagner Lucato, Professor, Universidade Nove De Julho, Brazil
 Milton Vieira Junior, Professor, Universidade Nove De Julho, Brazil

Technology Transfer (TT) process can be done accordingly to different models. This paper brings a brief review of TT concepts and of the most recent models, detaching their main characteristics.

15	<p>Friday, 09:15 AM - 10:45 AM, Los Angeles (Floor 5) <i>Track:</i> Product Innovation and Technology Management</p> <p><i>Session:</i> Investment in Information Technology</p> <p><i>Chair(s):</i> Kumiko Kissimoto</p>
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025-0079 IT Investment, IT Capability and Performance: A resource-based perspective

Mark Jacobs, Assistant Professor, University of Dayton College of Business, United States
 Roberto Chavez, Student, Esade Business School, Spain
 Wantao Yu, Senior Lecturer, Bucks New University, United Kingdom

This study investigates the relationships between IT investment, IT capability and performance. Our results suggest that IT investment significantly influences IT capability, and that IT capability is significantly and positively related to financial performance. We also find that IT capability partially mediates the effect of IT investment on financial performance.

025-0897 Production improvements through lean manufacturing and information technology

Claude Machline, Emeritus Professor, Centro Universitário São Camilo, Brazil
 Luis Pinochet, Professor, Centro Universitário São Camilo, Brazil
 Veronica Altheman, Lecturer, Centro Universitário São Camilo, Brazil

This study reviewed the papers written in Brazilian academic and technical journals and annals from 1999 to 2011, focusing the convergence between information technology and lean manufacturing. A field study made in a high tech factory showed in practice the convergence existing between information technology and jit-kanban-lean manufacturing.

025-1763 Manufacturing strategy and technology management: the interrelationship of machinery plants in world industry

Iván Arana-Solares, Associate Professor, Instituto Tecnológico y de Estudios Superiores de Monterrey, Mexico

Cesar Ortega Jimenez, Associate Professor, Universidad Nacional Autónoma de Honduras (UNAH), Honduras
 Jose Machuca, Professor, University Of Seville, Spain
 Jose Perez, Associate Professor, Universidad de Sevilla, Spain
 Pedro Garrido-Vega, Associate Professor, Universidad de Sevilla, Spain

An empirical study is conducted focusing on machinery plants in ten countries with a view to analyzing whether there are links between implementation of technology management and manufacturing strategy. It uses data from the High Performance Manufacturing project tested against congruence/fit models including the examination of the impact on performance.

025-1764 The interrelationship of technology management and manufacturing strategy in the electronics industry

Iván Arana-Solares, Associate Professor, Instituto Tecnológico y de Estudios Superiores de Monterrey, Mexico
 Cesar Ortega Jimenez, Associate Professor, Universidad Nacional Autónoma de Honduras (UNAH), Honduras
 Pedro Garrido-Vega, Associate Professor, Universidad de Sevilla, Spain
 Jose Machuca, Professor, University Of Seville, Spain
 Jose Perez, Associate Professor, Universidad de Sevilla, Spain

This paper includes an empirical study of electronics firms to analyze the extent to which technology management and manufacturing strategy factors are linked and their effect on operations performance. The study makes use of data generated in the international High Performance Manufacturing project tested against congruence/fit models.

025-1576 Maturity in the virtual organizations - the influence of IT architecture and the strategic alignment

Kumiko Kissimoto, Student, University Of São Paulo, Brazil
 Fernando Laurindo, Associate Professor, University Of São Paulo, Brazil

One aspect that is changing the way companies do their business in virtual organizations is the customer/enterprise relationship. This paper analyses the importance of the IT architecture and the alignment between IT and business strategy in order to cope with the changes in the environment and in the customer behavior.

16	Friday, 09:15 AM - 10:45 AM, Northwestern (Floor 6) <i>Session:</i> Managing Product Variety <i>Chair(s):</i> Goker Aydin	<i>Track:</i> Product Management
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025-0091 Bargaining for an Assortment

Hans S Heese, Associate Professor, Indiana University, United States
 Goker Aydin, Associate Professor, Indiana University Bloomington, United States

Consider a retailer who must compose an assortment from products offered by different manufacturers. We propose a model in which the retailer engages in simultaneous bilateral negotiations with individual manufacturers. We characterize the equilibrium assortment and profit allocation, and we explore how the equilibrium depends on manufacturer and product characteristics.

025-0497 Bundling Strategies for Vertically Differentiated Products

Dorothee Honhon, Assistant Professor, Eindhoven University of Technology, Netherlands
 Xiajun Pan, Assistant Professor, University Of Florida, United States

In this paper, we study how to choose the optimal bundling strategy for a retailer offering vertically differentiated products. We characterize conditions under which different bundling strategies are optimal respectively and provide efficient methods to identify optimal prices for offered products in order to maximize the retailer's profit.

025-0883 Variety competition for vertically differentiated products

Tulin Inkaya, Instructor, Arizona State University Tempe, United States
 Hongmin Li, Assistant Professor, Arizona State University Tempe, United States
 Dieter Armbruster, Professor, Arizona State University Tempe, United States
 Karl Kempf, Fellow, Intel Corporation, United States

We consider firms that offer products vertically differentiated by quality. Each firm maximizes total profit. We show that inventory cost may have a significant impact on the optimal choices for product variety. We analyze the product variety decisions for simultaneous and sequential games in monopoly, duopoly and more competitive markets.

025-1059 Managing Variety, Pricing, and Ordering Decisions for Substitutable Retail Products

Bacel Maddah, Associate Professor, American University of Beirut, Lebanon
 Ahmed Ghoniem, Assistant Professor, University Of Massachusetts Amherst, United States

We examine the problem where a retailer seeks to structure a product line of substitutable products over a selling horizon to maximize profit. This prompts a MINLP optimization model that jointly optimizes variety, dynamic pricing, and ordering decisions. Computational results are reported for large-scale instances along with managerial insights.

17	Friday, 09:15 AM - 10:45 AM, Ballroom C (Floor 5) <i>Session:</i> Empirical Research in Healthcare Operations <i>Chair(s):</i> Sarv Devaraj	<i>Track:</i> Healthcare Operations
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025-0539 Designing Health Care Supply Chain for Affordable Access to Primary Care: The Role of IT Leveraging Competence

David Zepeda, Student, University Of Minnesota, United States
 Kingshuk Sinha, Professor, University Of Minnesota, United States

In addressing the needs of a heterogeneous population, a central focus is on the affordability of care. Health IT has the potential to increase affordability. Using clinic level data this study evaluates affordability as a mediator of IT leveraging competence and as a moderator of enabling resources in primary care.

025-1246 Performance Impacts of EHR in Hospitals: A Configurational Approach

Sankara Srinivasan, Student, University Of Arkansas - Fayetteville, United States

Nirup Menon, Associate Professor, George Mason University, United States
 Pankaj Setia, Assistant Professor, University Of Arkansas - Fayetteville, United States

Implementation of EHR technologies has been a key for contemporary healthcare organizations. IS managers may need to focus on creating appropriate configurations of EHR to leverage these for enhanced performance impacts. This research applies the configurational perspective to examine synergies amongst EHR technologies implemented across hospitals.

025-1682 Connecting Dots for Patient Centered Care

Nitesh Chawla, Associate Professor, University Of Notre Dame, United States

Patient centric healthcare is presenting number of opportunities (and challenges) in integrating data about the patient from disease history to prescription. I will present our research that is providing the transformative analytical and visual framework for physicians and patients to chart the path from data to knowledge to impact.

025-0837 The Impact of Electronic Medical Records on Hospital Performance

Xin Ding, Assistant Professor, University Of Houston, United States
 Xiaosong (David) Peng, Assistant Professor, Texas A&M University College Station, United States

Majority of EMR or EHR studies utilize cross-sectional analyses or small samples of convenience. In this study, we utilize several national databases to examine the longitudinal impact of EMR adoption on a variety of hospital performance measures spanning clinical, operational, financial and patient levels.

18	Friday, 09:15 AM - 10:45 AM, Kansas City (Floor 5)	<i>Track:</i> Healthcare Operations
	<i>Session:</i> Operations Models in Healthcare	
	<i>Chair(s):</i> Burhaneddin Sandikci	

025-0978 Pay for (process) performance: Will it impact resource usage and which hospitals stand to benefit?

Christopher Tang, Professor, University Of California Los Angeles, United States
 Dimitrios Andritsos, Assistant Professor, Hec Paris, France

Motivated by the increasing popularity of process-oriented pay-for-performance programs, which reward a hospital's conformance to accepted medical guidelines, we use data on cardiac care to examine how the implementation of P4P programs may impact resource usage and what are the characteristics of hospitals which are more likely to succeed.

025-1023 An Optimization Framework for Smoothing Surgical Bed Census via Strategic Block Scheduling

Timothy Carnes, Student, Massachusetts Institute Of Technology, United States
 Retsef Levi, Associate Professor, Massachusetts Institute Of Technology, United States
 Peter Dunn, Executive Medical Director, Massachusetts General Hospital, United States
 Bethany Daily, Administrative Director, Massachusetts General Hospital, United States

Massachusetts General Hospital is a large academic hospital that runs over fifty operating rooms. Currently inpatient beds have peak usage in the middle of the week. Using an IP model to strategically adjust the surgical block schedule, we level-load the predicted use of beds, thus increasing the effective capacity.

025-0967 A Generalized Virtual Hospital: Innovative Models for Supporting a Hospital Reorganization Process

Roberto Revetria, Professor, University of Genoa, Italy
 Guido Guizzi, Assistant Professor, University of Naples, Italy
 Elpidio Romano, Lecturer, University of Naples, Italy

The presentation presents an innovative approach where Systems Dynamics and State Transition Diagrams are integrated building a flexible and general model able to reproduce complex healthcare operations in a tradeoff between complexity and flexibility. Model implemented for major Italian hospitals is supporting multi-year reorganizational process toward new vision of healthcare.

025-0710 Managing strained inpatient bed capacity through focused wings

Burhan Sandikci, Assistant Professor, University Of Chicago, United States
 Don Eisenstein, Professor, University Of Chicago, United States
 Tom Best, Student, University Of Chicago, United States
 David Meltzer, Associate Professor, University Of Chicago, United States

To address adverse effects of limited capacity, hospitals form wings with a specific number of beds and a set of patient types to admit. We present a model and numerical results based on real data for the computationally hard problem of forming wings.

19	Friday, 09:15 AM - 10:45 AM, Wisconsin (WI) (Floor 6)	<i>Track:</i> Healthcare Operations
	<i>Session:</i> Lean Healthcare	
	<i>Chair(s):</i> David Wood	

025-0266 Process Improvement in Health Care: Kaizen Approach to Lean in Outpatient Services at KCH

Matt Simko, Student, Northern Illinois University, United States

This case study examines the use of kaizen and lean at Kishwaukee Community Hospital in DeKalb, IL. The case explores the relationship between kaizen and lean in practice and discusses the benefits, challenges, and key success factors for using process improvement methodologies in health care.

025-0706 The Impact of Lean Implementation on Quality and Efficiency of US Hospitals

Yong-Taek Min, Student, School of Management, Operations & Technology Management Department, United States
 Jay Kim, Associate Professor, School of Management, Operations & Technology Management Department, United States
 Joseph Restuccia, Professor, School of Management, Operations & Technology Management Department, United States
 Michael Schwartz, Professor, School of Management, Operations & Technology Management Department, United States

This study develops a multivariate instrument to measure the extent of lean principles implemented in health sector using a recent survey of hospital quality improvement activities. We then explore its impact on hospital quality and efficiency by correlating the results with composite measures of publicly available data.

025-1232 Health Care Service Quality: Case Example of a Hospital with Lean Implementation

Nattapan Buavaraporn, Lecturer, University of Thai Chamber of Commerce, Thailand
 Prattana Punnakitikashem, Lecturer, College of Management, Mahidol University, Thailand
 Patchaya Maluesri, Student, College of Management, Mahidol University, Thailand
 Kanokporn Leelartapin, Student, College of Management, Mahidol University, Thailand

The purpose of this paper is to measure service quality of the hospital implementing Lean management. This paper assesses patients' expectation and satisfaction pertaining to hospital service quality. Data collected from 450 patients are analyzed by using the SERVQUAL model. The results of this study are presented.

025-0221 Taking the Pulse of Lean Healthcare

David Wood, Lecturer, Richard Ivey School of Business, Canada

In this study we examine Lean at 12 emergency departments by looking at labour efficiency, length of stay, and quality of service. The evidence indicates that Lean generated a material improvement at every hospital that implemented Lean, while those that did not saw continued decline.

21	Friday, 09:15 AM - 10:45 AM, Cook (Floor 3) <i>Session:</i> Efficiency, Productivity and Risk in Healthcare <i>Chair(s):</i> Antti Peltokorpi	<i>Track:</i> Healthcare Operations
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025-1646 Diagnostic Imaging Process Selection in Healthcare Operations

Larry White, Assistant Professor, Eastern Illinois University, United States

Healthcare providers have numerous options for diagnostic imaging. We investigate factors affecting diagnostic imaging process selection including the influence of stakeholders in the healthcare complex, incentive structures under which the providers operate, technology, regulations, research and the providers' decision-making logic. The impact of those factors on patient care is assessed.

025-1790 Behavioral Heterogeneity in Women's Adherence and Its Role in Optimal Breast Cancer Screening Policies

Oguzhan Alagoz, Associate Professor, University Of Wisconsin Madison, United States
 Turgay Ayer, Assistant Professor, Georgia Institute Of Technology, United States
 Natasha Stout, Assistant Professor, Harvard Medical School, United States
 Elizabeth Burnside, Associate Professor, University of Wisconsin Medical School, United States

Mammography screening is recommended for early diagnosis of breast cancer, the leading cause of female cancer deaths. On the other hand, there is significant heterogeneity in women's adherence to screening recommendations. This paper analyzes the role of behavioral heterogeneity in women's adherence on optimal mammography screening recommendations.

025-0989 Economy of scale and scope in healthcare operations: lessons from surgical services

Paulus Torkki, Student, Aalto University, Finland
 Irma Jousela, Professor, University of Helsinki, Finland
 Mauri Lepäntalo, Professor, University of Helsinki, Finland
 Antti Peltokorpi, Assistant Professor, Aalto University, Finland

Literature about economy of scale and scope in healthcare is confusing. We present theoretical framework about the concepts in healthcare. We illustrate how understanding the concepts properly can improve productivity by 30 %. In conclusion, effects of the scale and scope depend on the used definitions and production context.

025-1218 Developing productivity measurement system in healthcare

Vesa Kamarainen, Instructor, Aalto University, Finland
 Antti Peltokorpi, Assistant Professor, Aalto University, Finland
 Paulus Torkki, Student, Aalto University, Finland

Healthcare systems consist of different organizations that optimize productivity based on their own objectives. This study examines how to develop system, organization, and unit metrics that avoid sub-optimization. Results show that productivity measurement should be approached as a one entity that takes into account different parts involved in care processes.

22	Friday, 09:15 AM - 10:45 AM, Ballroom G (Floor 5) <i>Session:</i> Customer Wait and Resource Management <i>Chair(s):</i> Anurag Agarwal	<i>Track:</i> Service Operations
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025-1489 A service facility system with Reactive Customers and Service Providers

Ann van Ackere, Professor, Universite De Lausanne, Switzerland
 Carlos Arturo Delgado Alvarez, Student, Universite De Lausanne, Switzerland
 Erik Larsen, Professor, University Of Lugano, Switzerland

We address a service facility problem where customers must routinely choose a facility for service and managers may adjust the service capacity. Both managers and customers base their decisions on their perceptions about the system. Agent based simulation is applied to study the micro-dynamics of the system.

025-1591 Customer Waiting: Is What is Experienced What is Remembered?

Kimberly Whitehead, Student, University Of Texas Arlington, United States

Customer wait time is commonly assumed to directly affect repurchase intentions. Wait time evaluations based on experienced wait times might not correlate with those based on remembered wait times. Managing customer remembrance might offer a greater payoff in terms of repurchase intentions than simply managing experienced wait time.

025-1418 Minimizing Risk in Emergency Response Service Operations with Multiple Types of Equipment

Anurag Agarwal, Associate Professor, University Of South Florida, United States

Vaidy Jayaraman, Associate Professor, University Of Miami, United States
Rajesh Srivastava, Professor, Florida Gulf Coast University, United States

In this paper we develop a mixed integer non-linear mathematical model for locating emergency response services involving multiple types of equipment, with the objective of minimizing the risk of uncovered demand. Given the NP-Hard nature of the problem, we also propose some heuristics to solve the problem.

025-0860 Bad Customer Service Downgrades Good Quality of Care

Adalberto Belluomini, Professor, Eaesp - Fgv, Brazil
Claude Machline, Emeritus Professor, Centro Universitário São Camilo, Brazil
Fernando Serson, Manager, Eaesp - Fgv, Brazil

A satisfaction survey was undertaken in 2011 in a Brazilian health plan. A sample of 1,600 patients in a universe of 950,000 clients was interviewed. Quality of care was rated as 4 in a Likert scale. Overall satisfaction was downgraded to 3.7 by excessive waiting times to be serviced.

23	Friday, 09:15 AM - 10:45 AM, Miami (Floor 5)	<i>Track:</i> Service Operations
	<i>Session:</i> Service Quality and Operations Strategy	
	<i>Chair(s):</i> Hua-Hung Weng	

025-0835 It ain't what you do, it's the way that you do it: the impact of strategic fit on business performance

Steve Brown, Professor, University of Exeter, United Kingdom
Richard Cuthbertson, Senior Lecturer, Oxford University, United Kingdom
Alex Hill, Senior Lecturer, Kingston University, United Kingdom

Empirical research was conducted in twelve service organisations to understand the impact of internal strategic fit on business performance. The findings suggest that the approach used to create fit is more significant in improving business performance than the level of fit it creates.

025-0972 More Service Is Better? An Exploratory Study on Excessive Service

Hai-Tien Feng, Student, Yuan-Ze University, Taiwan, Republic of China
Hua-Hung Weng, Assistant Professor, Yuan-Ze University, Taiwan, Republic of China

Recent study suggests that customer loyalty won't keep increasing when service exceeding customer expectation. In this study, we designed a 3x2 experiment to investigate customers' reactions after they perceived different levels of service. Collected in Taiwan, the preliminary data show that customers are not always happier when they perceived more.

025-1229 Complexity in services: An interpretative framework

Ornella Benedettini, Lecturer, University of Cambridge, UK, Italy
Andy Neely, Professor, University Of Cambridge, United Kingdom

Drawing on a systematic review of literature, the paper will analyze the characteristics of service complexity. In particular, the paper will propose an interpretative framework that maps the potential factors that make a service complex and provides a general taxonomy to distinguish the nature of the complexity in a service.

025-1756 Presence of servant company elements in a restaurant

Tereza Souza, Professor, Universidade Potiguar, Brazil
Patricia Whebber, Professor, Universidade Potiguar, Brazil
Catherine Carvalho, Assistant Professor, Universidade Potiguar, Brazil
Kleber Nobrega, Professor, Universidade Potiguar, Brazil

The present study evaluated the presence of servant company elements in a restaurant. Sixteen managers, 109 employees and 200 customers were interviewed. Differences of opinion between staff and customers were found. The most valued and perceived attributes were: flexibility, organization, care of clients, responsibility, desire to help and usefulness

24	Friday, 09:15 AM - 10:45 AM, Minnesota (MN) (Floor 6)	<i>Track:</i> OM in China/East Asia
	<i>Session:</i> Quality Improvement Practice and Methods	
	<i>Chair(s):</i> Dongli Zhang	

025-0242 Quality Management Practices in China: What is more effective?

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

This research is designed to investigate the impact of national culture on the effectiveness of QM practices in China. QM principles and practices were introduced to China decades ago. However, quality issues are still among the top concerns for made-in-China products.

025-0688 A study of the application of Internet of Things in China's household appliance industry

Yong Lin, Associate Professor, Greenwich business school, United Kingdom
Li Zhou, Associate Professor, Greenwich business school, United Kingdom

The objectives are to understand the current application of IoT (Internet of Things) in China's household appliance industry; to identify the challenges in the course of implementation; to propose a practical approach to improve IoT-based home appliance industry in China. The research methods are SSM (Soft System Methodology) and benchmark.

025-0649 Factors behind development of operations infrastructure in emerging economies: An Empirical Study

Kaushik Sengupta, Associate Professor, Hofstra University, United States

Certain factors that promote and support development of operations infrastructure are key in the long term success of emerging economies. Based on extant literature and in-depth survey of an East Asian emerging economy, we examine the state of operations in the country and a framework for analysis.

26	Friday, 11:15 AM - 12:45 PM, Scottsdale (Floor 5)	<i>Track:</i> Behavioral Operations
	<i>Session:</i> Behavior in Decision Making	
	<i>Chair(s):</i> Xiaobo Zhao	

025-0765 The horizontal fairness concern of backup supplier in a triadic supply chain

Junlin Chen, Student, Tsinghua University, China
 Max Shen, Professor, University Of California Berkeley, United States
 Xiaobo Zhao, Professor, Tsinghua University, China

A triadic supply chain comprises a manufacturer and two suppliers playing primary and backup roles. Our laboratory experiment provides evidence of horizontal fairness of backup supplier. Model analysis characterizes optimal decisions, which show that fairness concern does not always benefit backup supplier and is of particular consideration to manufacturer.

025-1231 Toward An Integrated Framework of Timing and Inventory Management for Introduction of Product Line Extensions

Max Shen, Professor, University Of California Berkeley, United States
 Tony Ke, Student, University Of California Berkeley, United States

We study the problem of when to introduce a product line extension with an existing version, in an integrated inventory (supply) and diffusion (demand) framework. We characterize the optimal introduction time, depending upon the marketplace settings. Case studies from different industries highlight the importance of coordination of marketing and operations.

025-0849 Social Network Effects on Coordination: A Laboratory Investigation

Gary Bolton, Professor, Penn State University State College, United States
 Yang Zhang, Student, Penn State University State College, United States

We examine a coordination game in which each player engages with a connected subset of the player population, which defines a social network. In high-density networks, we observe coordination consistent with the payoff-dominant equilibrium. In sparser networks, more socially connected players exhibit higher levels of coordination than do less connected.

025-0650 Inventory Pooling and Allocation in the Presence of Information Asymmetry

Karen Donohue, Associate Professor, University Of Minnesota, United States
 Mustafa Cagri Gurbuz, Professor, Zaragoza Logistics Center, Spain
 Eirini Spiliotopoulou, Student, Zaragoza Logistics Center, Spain

We consider the impact of inventory pooling and stock allocation under information asymmetry on total and individual profits of retailers forming a pooling coalition. We study how the allocation scheme affects both forecast sharing and retailers' orders to the central planner when firms have private information about their local demand.

27	Friday, 11:15 AM - 12:45 PM, Lincolnshire II (Floor 6)	<i>Track:</i> Empirical Research in OM
	<i>Session:</i> Empirical Research in OM III	
	<i>Chair(s):</i> Larissa Araujo	

025-1287 Supply Chain Quality Management Practices and Performance: An Empirical Study

Jing Zeng, Student, Yokohama National University, Japan
 Yoshiki Matsui, Professor, Yokohama National University, Japan
 Phan Ahn, Lecturer, University of Economics and Business, Vietnam National University, Hanoi, Vietnam

This study empirically investigates the relationship among upstream, internal, and downstream quality management (QM) in manufacturing companies and their impact on quality performance. We found that internal QM impacts on both upstream and downstream QM, and that internal QM improves quality performance both directly and indirectly through downstream QM.

025-1009 Learning and Knowledge Creation in Continuous Improvement Efforts - A Pilot Study

Jamison Kovach, Assistant Professor, University Of Houston, United States
 Lawrence Fredendall, Professor, Clemson University, United States

This research investigates the effect of continuous improvement practices on organizational performance and the role that knowledge plays in the relationship between continuous improvement practices and performance. Data was collected through a survey of practitioners who have used continuous improvement practices in their organizations within the last three years.

025-1449 A Research Framework for Operations Management in Large Scale Construction Projects

Larissa Araujo, Student, Universidade De Sao Paulo, Brazil
 Fabio Guerrini, Associate Professor, Universidade De Sao Paulo, Brazil

Large Scale Construction Projects (ETO systems) are inherently dynamic and complex, configured by networks operating as Virtual Enterprises. This work shows a research framework developed for the Operations Management of these projects. The framework included collaboration aspects, representing a useful reference for decision making processes in these networked environments.

025-1822 A 3C View on Last-Mile Logistics

Xin Jin, Student, Cambridge University, United Kingdom
 Jagjit Srail, Cambridge University, United Kingdom

The 'last-mile' (LM) is the last stretch of the supply chain which is considered as one of the most, or even the most, inefficient, expensive and polluting part. We borrowed context-configuration-capability (3C) concepts from strategic management theories to develop an overall framework of LM issues to make further analysis easier.

28	Friday, 11:15 AM - 12:45 PM, Ohio State (Floor 6)	<i>Track:</i> Humanitarian Operations and Crisis Management
	<i>Session:</i> Capabilities, Collaboration, and Execution in Disaster Response Logistics	
	<i>Chair(s):</i> Keenan Yoho Susan Heath	

025-0139 Capabilities and Competencies in Humanitarian Operations
 Aruna Apte, Assistant Professor, Naval Postgraduate School, United States
 Keenan Yoho, Assistant Professor, Naval Postgraduate School, United States

Response to a sudden onset humanitarian crisis often involves a request for military assistance. We identify the core competencies of the military and discuss the implications for response coordination in a disaster area.

025-0140 Collaboration and Humanitarian Logistics
 Ned Powley, Assistant Professor, Naval Postgraduate School, United States
 Aruna Apte, Assistant Professor, Naval Postgraduate School, United States

When disaster strikes and crisis ensues, human beings bond together. They find ways to connect and develop strong relationships to weather the storm, even despite potential differences. We provide recent case studies--the earthquakes in Haiti, Chile, and Japan--to examine differences and lessons learned in the collaborative aspects of humanitarian logistics.

025-0141 Disaster Response Logistics: In the Zone
 Susan Heath, Assistant Professor, Naval Postgraduate School, United States

Through experimentation with a simulation model we explore questions regarding the effectiveness of: different uses of logistics resources, prioritization of certain logistics activities such as the movement of severely injured victims or the delivery of water, and different levels of inter-organizational communication.

025-1164 An Analysis of United States Navy Disaster Relief Operations
 Aruna Apte, Assistant Professor, Naval Postgraduate School, United States
 Cameron Ingram, Lieutenant, United States Navy, United States Navy, United States
 Cullen Greenfield, Lieutenant, United States Navy, United States Navy, United States
 Keenan Yoho, Assistant Professor, Naval Postgraduate School, United States

Currently, there is no mechanism to explicitly evaluate the utility of naval vessels for disaster response. We discuss the characteristics of specific USN vessels in the context of three disaster events as well as the implications for the future force structure of the Navy.

29	Friday, 11:15 AM - 12:45 PM, Purdue (Floor 6)	<i>Track:</i> Humanitarian Operations and Crisis Management
	<i>Session:</i> Costs in Humanitarian Operations	
	<i>Chair(s):</i> Emmett Lodree	

025-1146 Inventory control for hurricane events: a commercial perspective
 Emmett Lodree, Assistant Professor, University Of Alabama Tuscaloosa, United States

Motivated by the effective response of corporations such The Home Depot and Walmart following Hurricane Katrina in 2005, this presentation discusses several mathematical models that can be used to optimize inventory control policies in preparation for probable hurricane activity. The relevance and interests of for-profit organizations are highlighted.

025-0615 Finding the Best Cost-Efficient Food Assortment for a Non-for-Profit Firm
 Betzabe Rodriguez, Assistant Professor, University Of Puerto Rico, Puerto Rico
 Magaly Gonzalez, Student, University Of Puerto Rico, Puerto Rico

Consider a non-profit firm that provides food to consumers where operational costs are highly affected by the assortment to offer. The assortment demand is uncertain and influenced by the presence of other items within the assortment. A mathematical formulation was developed to find the most cost-efficient assortment.

025-1792 Business Best Practices for Disaster Recovery
 Jack Crumbly, Assistant Professor, Tuskegee University, United States
 Nezh Altay, Associate Professor, Depaul University, United States

Companies, especially small firms are vulnerable to major disruptions such as natural disasters, hacking attacks, or terrorism. Our goal in this research project is to identify best practices businesses use to recover from disruptions due to natural disasters. We focus our attention to hurricanes.

30	Friday, 11:15 AM - 12:45 PM, Great America II (Floor 6)	<i>Track:</i> OM Practice
	<i>Session:</i> Operations Management and Finance Interface I	
	<i>Chair(s):</i> Song Yang	

025-0510 Integrating inventory replenishment and cash payment decisions in supply chains
 Wei Luo, Student, Duke University Durham, United States
 Kevin Shang, Associate Professor, Duke University Durham, United States

We study a two-stage supply chain where each location procures inventory based on cash available. We consider different payment schemes and derive joint optimal and near-optimal inventory and payment policies. Our study reveals insights on how firms should manage their working capital in order to achieve the supply chain efficiency.

025-0599 Going Out of Business: Applying Management Science to Retailer Liquidation
 Ananth Raman, Professor, Harvard University, United States
 Nathan Craig, Student, Harvard University, United States

Liquidation is of critical importance to the retail industry. Bankruptcy and, thus, liquidation are common in retailing. Further, retailers often post inventory as collateral for asset-based loans, the terms of which depend on liquidation value. In this presentation, we introduce methods for increasing the efficiency of retail chain liquidation.

025-1596 Why Risk-neutral Manufacturers Ought to Hedge Commodity Material Purchases

Panos Kouvelis, Professor, Washington University St Louis, United States
 Ehsan Bolandifar, Student, Washington University in St. Louis, United States
 Danko Turcic, Assistant Professor, Washington University in St. Louis, United States

We study hedging of commodity inputs in a bilateral monopoly supply chain and report non-trivial differences between hedging in non-strategic and supply chain settings. In the former, hedging is generally value increasing. In the latter, hedging may reduce the hedger's own payoff. The result is sensitive to how firms contract.

025-1802 Improving Operational Competitiveness through Bankruptcy

Song Yang, Assistant Professor, London Business School, United Kingdom
 John Birge, Professor, University Of Chicago, United States
 Rodney Parker, Associate Professor, University Of Chicago, United States

We model in detail the corporate bankruptcy reorganization process in a supply chain setting, study the effect of bankruptcy on the firms' operational decisions and the interaction between suppliers and buyers, describe how bankruptcy influences companies' operational efficiency and market competition, and examines how this recourse influences firms' pre-bankruptcy.

31	Friday, 11:15 AM - 12:45 PM, Dupage (Floor 3)	<i>Track:</i> Scheduling and Logistics
	<i>Session:</i> Some Emerging Scheduling Models	
	<i>Chair(s):</i> Xiangtong Qi	

025-1593 Coordination Issues for Timely Processing of Outsourced Operations

Tolga Aydinliyim, Assistant Professor, University Of Oregon, United States

We consider a dynamic capacity booking problem faced by multiple manufacturers outsourcing to a third-party. Each manufacturer has the option to optimally book remaining capacity or coalesce with a subset of manufacturers. We model the interaction among all involved parties as a cooperative savings game and present core allocation schemes.

025-1058 An Optimization Model for Loan Extension

Zhixin Liu, Assistant Professor, University Of Michigan Dearborn, United States
 Bo Chen, Associate Professor, Hefei University of Technology, China

We study how to make efficient extension decisions over consumer term loan accounts using a Markov chain model. Our model determines an optimal extension action at each state and period for a consumer type to maximize the lender's expected value, taking extension history into consideration.

025-0977 Minimizing TWT on a BPM with Incompatible Job-families and Dynamic Job Arrivals

M Vimala Rani, Reader, Electronic City, India
 Muthu Mathirajan, Associate Professor, Indian Institute of Science, Bangalore, India

This study addresses the scheduling of a diffusion furnace with dynamic job-arrivals, and incompatible job-families with the objective of minimizing total weighted tardiness. Due to the computational intractability, a few heuristic algorithms based on the EDD, CR, ST, and 4 variants of ATC dispatching rules are proposed. A series of computational experiments carried-out indicated that one of the variant of the ATC rule has excellent performance in comparison with an estimated optimal solution.

025-1195 Scheduling jobs on a single BPM with non-agreeable release time and due dates to minimize makespan

Satish Nayak, Project Manager, WIPRO Technologies, India
 Ganeshkumar Palanichamy, Technical Leader, WIPRO Technologies, India

This paper propose research problem of scheduling on BPM with non-agreeable release time, due dates with the objective of minimizing makespan. Our aim is to develop an efficient algorithm from the set of heuristic-algorithm for solving the BPM problem. The efficiency of the developed algorithm is then tested through extensive computational experiments.

025-0364 Storage space allocation models for inbound containers in an automatic container terminal

Xiangtong Qi, Associate Professor, Hong Kong University Of Science & Tech, Hong Kong
 Mingzhu Yu, Student, Hong Kong University Of Science & Tech, Hong Kong

We study the problem of improving the operations efficiency for retrieving inbound containers in a modern automatic container terminal by designing an ideal storage layout and an overnight re-marshalling process. Models and optimal algorithms are presented.

32	Friday, 11:15 AM - 12:45 PM, Ballroom A (Floor 5)	<i>Track:</i> Sustainable Operations
	<i>Session:</i> Product Design, and Warranties	
	<i>Chair(s):</i> Tim Kraft	

025-0194 The NGO's Dilemma: How to Influence Firms to Replace a Potentially Hazardous Substance

Tim Kraft, Assistant Professor, University Of Virginia, United States
 Yanchong Zheng, Assistant Professor, Massachusetts Institute Of Technology, United States
 Feryal Erhun, Assistant Professor, Stanford University, United States

In this paper, we analyze an NGO's decisions when a substance within a product is identified as potentially hazardous (e.g., BPA). Specifically, we determine under what market and regulatory conditions an NGO should target the industry versus a regulatory body in order to influence firms to replace a substance.

025-0473 Design for Industrial Symbiosis: Impact of Coopetition

Yunxia Zhu, Student, University Of Texas Dallas, United States

Milind Dawande, Professor, University Of Texas Dallas, United States
 Vaidy Jayaraman, Associate Professor, University Of Miami, United States
 Tharanga Rajapakshe, Assistant Professor, University Of Florida, United States

We consider the impact of cooperation on the strategic decision of implementing an industrial symbiotic system. We examine a duopoly where firms engage in cooperation through sharing of waste. We analyze the extent and the intensity of cooperation under various scenarios and comment on their influence on the implementation decision.

025-0586 Warranty Inventory Optimization with Advance Supply Information

Warren Hausman, Professor, Management Science and Engineering, United States
 John Khawam, Assistant Professor, Naval Postgraduate School, United States

In warranty inventory management, customers return allegedly malfunctioning products for replacement. Useful products may be recovered through testing and/or remanufacturing processes. We use dynamic programming and heuristics to develop analytical models that determine the optimal ordering decisions under various levels of reverse channel visibility, which we call Advance Supply Information.

025-1104 Green Servicizing and Product Design

Vishal Agrawal, Assistant Professor, Georgetown University, United States
 Ioannis Bellos, Student, Georgia Institute Of Technology, United States

In recent years, manufacturers from various industries have begun to orient their practices towards selling the service of a product as opposed to selling the product itself. In this paper we investigate the economic and environmental implications of the manufacturer's design decisions under a servicizing business model.

33	Friday, 11:15 AM - 12:45 PM, Denver (Floor 5) <i>Session:</i> Corporate Social Responsibility <i>Chair(s):</i> Marina Mattera	<i>Track:</i> Sustainable Operations
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025-0814 The relationship between social and environmental practices with operational capabilities

Leonardo Maia, Student, Universidade Federal de Uberlândia, Brazil
 Ely Paiva, Associate Professor, Fundacao Getulio Vargas, Brazil

In addition to the pressure for increasing operational performance, companies should develop sustainable policies. Based on the resource-based theory, the authors propose a theoretical model that analyzes the relation between operational and sustainable practices with operational capabilities in order to satisfy social and environmental objectives and winning orders competitive criteria.

025-0951 Sustainable CSR and sustainable operations

Jennifer Shang, Associate Professor, University Of Pittsburg, United States
 Wei Chen, Student, University Of Pittsburg, United States

Corporate Social Responsibility (CSR) has received increasing awareness by most firms. This paper proposes a framework that depicts how to balance between firms' CSR activities and regular operations; so that firms can maintain both CSR and operations sustainable in a long term.

025-1152 Walking the Walk vs Talking the Talk: An Evaluation of Social Responsibility Strategies and Firm Performance

Sarv Devaraj, Professor, University Of Notre Dame, United States
 Kevin Linderman, Associate Professor, University Of Minnesota, United States
 Suvrat Dhanorkar, Student, University Of Minnesota, United States
 Johnny Rungtusanatham, Professor, Ohio State University, United States

We propose a typology of corporate social responsibility (CSR) strategies based on corporate communications and actions. Our analysis reveals significant performance implications of adopting each strategy - 'avoidance', 'image-management', 'action-orientation' and 'responsible leadership'. We find that institutional behaviors namely 'decoupling' and 'conformance' strongly influence the outcome of a CSR strategy.

025-0181 Moral has no seasons: Using CSR as a key element for achieving competitive advantages

Marina Mattera, Assistant Professor, Universidad Europea de Madrid, Spain

Firms' new challenges in the 21st century involve innovation and society's request for a more responsible business model. Based on bounded rationality conditions and the important role of externalities, it is analyzed through a case study whether corporate social responsibility strategies are essential for companies to achieve sustainable competitive advantages.

34	Friday, 11:15 AM - 12:45 PM, Ballroom H (Floor 5) <i>Session:</i> Retail Innovations and Supply Chain Performance <i>Chair(s):</i> Qingning Cao	<i>Track:</i> Vendor and Supply Contracts
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025-0783 Bundling under limited supply

Jun Zhang, Assistant Professor, University Of Texas Dallas, United States
 Kathryn Stecke, Professor, University Of Texas Dallas, United States
 Qingning Cao, Student, University Of Texas Dallas, United States

This paper examines a retailer's two-product bundling decision when the supply of one product is limited. This paper derives the retailer's optimal prices, stocking levels, and profits under unbundling and bundling. Demonstrating that limited supply can induce the retailer to bundle, this paper highlights a new supply-side rationale for bundling.

025-1701 Supplying Key Components Exclusively? Or Welcome Competition?

Ying-Ju Chen, Assistant Professor, University Of California Berkeley, United States
 Yen-Ting Lin, Assistant Professor, University Of San Diego, United States

We study outsourcing strategy of two competing OEMs whose products require a key component. Each OEM outsources production to a manufacturer K who produces the key component, or to a manufacturer S who provides higher product quality. We examine manufacturer K's value of controlling the supply of the key component.

025-0074 Exploring effective solutions of CCDEA using initial search point selection

Anthony Ross, Professor, University Of Wisconsin Milwaukee, United States
Wanxi Li, Student, University Of Wisconsin Milwaukee, United States

This paper develops a chance-constrained efficiency approach to estimating the efficiencies of DMUs given their stochastic input and output metrics. Scholars report that computational challenges emerge due to the underlying problem structure. This paper demonstrates the centrality of initial search point selection to generating effective solutions.

35

Friday, 11:15 AM - 12:45 PM, Illinois (IL) (Floor 6)

Track: Manufacturing Operations

Session: Lean Management

Chair(s): Hamilton Pozo

025-1375 Impact of Skill Chaining and Selective Cross Training in Lean Production Systems

Michael Braunscheidel, Assistant Professor, Canisius College, United States
Nallan Suresh, Professor, Suny At Buffalo, United States

This study investigates dynamic performance of lean manufacturing, involving U-shaped cells with the concept of skill chaining. Insights from queuing models are followed by simulation of a larger shop setting and statistical analysis of data. Several levels of chained labor flexibility, lot size, setup reduction, and labor assignment are assumed.

025-0092 Lean Manufacturing in SMEs: The Mexican Experience

Nigel Williams, Professor, Bedfordshire, United Kingdom
Omar Salgado, Professor, EGADE Business School, Mexico
Sergio Ibarra, Student, Itesm Cem, Mexico

Lean Manufacturing has been applied in large enterprises, especially Multinational Enterprises (MNEs). However, little research has evaluated the applicability and effectiveness of Lean manufacturing to SMEs from emerging markets. Using case studies, this paper evaluates the drivers and barriers to adoption of lean production techniques for SMEs in Mexico.

025-0155 Effectiveness of Lean Management Tools: Problem Solving Process at Automotive Industry

Raed EL-Khalil, Assistant Professor, Lebanese American University, Lebanon

The lean management tools and/or techniques are designed to support quality improvement, cost and time reduction. The purpose of this paper is to examine the lean problem solving process efficiency and effectiveness at 6 automotive assembly plants in North America. Recommendations for practitioners would conclude the research.

025-1403 The application of the concept of lean and cleaner production to gain productivity and flexibility

Telma Torricelli, Student, Faccamp - Faculdade Campo Limpo Paulista, Brazil
Hamilton Pozo, Student, Faccamp - Faculdade Campo Limpo Paulista, Brazil
Antonio Gonçalves, Assistant Professor, Faccamp - Faculdade Campo Limpo Paulista, Brazil

The objective of this paper is to demonstrate the gain in productivity and flexibility when adopted the system of lean and cleaner production with the use of modern management tools. The result of applied research in a small manufacturing company in the region of Jundiai / SP confirms the proposal.

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Friday, 11:15 AM - 12:45 PM, Ballroom B (Floor 5)

Track: Supply Chain Management

Session: Green Supply Chains 3

Chair(s): Kenneth Petersen

025-1414 Efficiency analysis of Brazilian logistic service providers (LSP) in temperature controlled supply chains (TCSC)

Mônica Maria Luna, Associate Professor, Federal University Of Santa Catarina, Brazil
Carlos Fries, Student, Federal University Of Santa Catarina, Brazil
Ismael Zamoner, Student, Federal University Of Santa Catarina, Brazil

TCSC are known to need specialized solutions to warrant quality of perishable products. This work analyses Brazilian LSP of TCSC regarding scale efficiency and its relationship with the use of information and communication technology (ICT). Results exhibit lack of relationship between LSP's degrees efficiency and use of ICT.

025-0030 Green supply chain management: An integration of theory of reasoned action and ethical decision making

Dara Schniederjans, Student, Texas Tech University, United States
Chris Starkey, Student, Texas Tech University, United States

One driver for the development of environmental management capabilities in supply chains is competitive pressure. In this study we use the theory of reasoned action to address how teleological and deontological evaluation of GSCM practices from senior management impacts GSCM adoption in firms and how competitive intensity mitigates this relationship.

025-1199 Marine Highways: Reducing Carbon and Congestion

Willard Price, Professor, University Of Pacific, United States

This research examines Marine Highways M580 and M80 in California, competing to move containers inland. The logistic system is modeled with performance expectations. Public ports and private operators are engaged, acting through a public-private partnership. Commercial viability of several actors is evaluated, along with regional environmental and transport benefits.

025-1412 Capturing the economic benefits of green logistics: The roles of visibility and exploratory links

Benn Lawson, Associate Professor, Cambridge University, United Kingdom
Kenneth Petersen, Professor, University Of Tennessee Knoxville, United States

Paul Cousins, Professor, Manchester Business School, United Kingdom
 Brian Fugate, Associate Professor, Colorado State University Fort Collins, United States

Green logistics is central to improving supply chain sustainability. We examine the effects of environmental orientation on green logistics, moderation effects of working with non-traditional partners and improving supply chain visibility, and subsequent environmental and cost performance. Results from 232 UK manufacturing firms are largely in line with expectations.

025-0011 Research on a model for optimization design of reverse Logistics network

Feng Qincao, Professor, Southeast University, China
 Jiang Xiaogan, Professor, Southeast University, China
 Han Yong, Professor, Southeast University, China

In order to improve the efficiency of traditional reverse logistics network. This paper designed the reverse logistics network. Then this paper constructed the model of mixed integer linear planning. At last, this paper analyzed an example which considered three optional centers of dismantling, four optional remanufacturing centers and five testing centers.

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Friday, 11:15 AM - 12:45 PM, Houston (Floor 5)

Track: Supply Chain Management

Session: Green Supply Chains 1

Chair(s): Janice Carrillo

025-0915 Performance implications of sustainable supply chain in food industry: An empirical study

Gisele Mendy Bilek, Assistant Professor, Université de Pau et des Pays de l'Adour, France
 Anaud Bilek, Associate Professor, University of Pau, France

Sustainable issues within the supply chain are forcing companies to reconsider their business models and their operations. This paper attempts to develop a theoretical framework of sustainability in Supply Chain and to compare it by means of an empirical study using perceptions and practices of selected companies in food industry.

025-0955 Environmental Implications for Strategic Supply Chain Decisions: The Role of Location and Scale

Nazli Turken, Student, University Of Florida, United States
 Janice Carrillo, Associate Professor, University Of Florida, United States

In this paper, we investigate the environmental effects of plant size and location decisions. We first consider capacity expansion and scale choices, given regional and national regulations on emissions. Next we incorporate transportation decisions into the model to explicitly capture the trade-off between plant size and the dispersion.

025-0604 Green Supply Chain Sustainability: The Indian Automobile Industry Perspective

Yatish Prasad Dasari, Student, Op Jindal Global University, India
 Saroj Koul, Professor, Op Jindal Global University, India

Indian Automobile Industry growing at 20% till 2015 has implications of amplifying carbon footprints. The need for Green SCM rises as traditional supply chains fail to strike the right chord between industrial and environmental sustainability. This research substantiates the payoff between industry and environment through Nash equilibrium: point of sustainability.

025-0677 Analyzing the Barriers to Transparent Food Supply Chains

MohdNishat Faisal, Assistant Professor, Qatar University, Qatar

The purpose of this research is to identify barriers to transparency in food supply chains and to understand their mutual relationships. Interpretive structural modeling (ISM) was applied to present a hierarchy-based model and to identify the contextual relationships among these barriers. The research shows that there exists a group of barriers that have a high driving power and low dependence requiring maximum attention and are of strategic importance. This classification will help supply chain managers to differentiate between independent and dependent variables and further help them to focus on those variables that are most important for creating transparent supply chains.

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Friday, 11:15 AM - 12:45 PM, Watertown (Floor 10)

Track: OM in Travel, Tourism, and Hospitality Industries

Session: Emerging Issues in Sustainable Hospitality

Chair(s): Jie Zhang

025-0219 Green Moment of Truth: Environmental Sustainability Strategy in High Contact Service Systems

Nitin Joglekar, Associate Professor, Boston University, United States
 Rohit Verma, Professor, Cornell University, United States
 Jie Zhang, Assistant Professor, University Of Vermont, United States

Customers experience numerous moments of truths that reduce information asymmetry in high contact service systems such as hospitality. Our research investigates a central question in environmental sustainability strategy: how should a service provider manage customer expectation by appropriately signaling environmental sustainability and encourage customer engagement through consistent operation.

025-0928 Analysing client's valuation in Spanish ISO 14001 certified hotels

Maria-del-Val Segarra-Ona, Associate Professor, Universitat Politcnica de Valencia-Cornell University, Spain
 Angel Peiro-Signes, Assistant Professor, Universitat Politcnica de Valencia-Cornell University, Spain
 Rohit Verma, Professor, Cornell University, United States

Benefits derived from the implementation of environmental certifications as the ISO14001 in hotels have been found but there is still a research gap linking it with client's valuations. We analyze 6850 Spanish hotels finding higher values in housekeeping accuracy, comfort, services, staff and total value in those hotels with it.

025-1070 Carbon Neutrality in Hospitality Industry: A Closer Examination

Kanwalroop Dhanda, Associate Professor, Depaul University, United States

This paper explores carbon neutrality in the hospitality industry. There are numerous claims being made that range from being a green hotel to providing an eco-tourism experience? Are these claims misleading and an exercise in greenwashing or are these industry participants actually changing business practices to be more sustainable?

025-1679 The Future of Trade Shows, Meetings and Conventions
 Spring Han, Lecturer, Center for Hospitality Research, United States
 Rohit Verma, Professor, Cornell University, United States

Meetings, Incentives, Conventions, and Exhibitions (MICE) are an important component of hospitality industry and contribute significantly to revenue and employment in several cities. Due to advances in technology, growing importance sustainability & cost reduction, the MICE industry is going through a major paradigm shift. Emerging research issues will be discussed.

39	Friday, 11:15 AM - 12:45 PM, Ballroom F (Floor 5) Session: Managing Technology Projects Chair(s): Luiz Alves	<i>Track:</i> Product Innovation and Technology Management
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025-0195 Assessing the maturity of project management competences and organization in industrial contexts
 Matteo Kalchschmidt, Associate Professor, Universita Degli Studi Di Bergamo, Italy
 Tommaso Buganza, Associate Professor, Politecnico Di Milano, Italy
 Emilio Bartezzaghi, Professor, Politecnico Di Milano, Italy

The work focuses on the analysis of 21 project-based companies aimed at assessing the competences of the organization in managing projects. 188 project managers were interviewed in order to assess the maturity of the PM organization. Considerations on areas of future development of the discipline are provided.

025-0368 Competitive advantages gained through the establishment of Innovation
 Luiz Alves, Professor, Universidade Federal De Juiz De Fora, Brazil
 Thais Ferraz, Professor, Universidade Federal de Itajubá, Brazil
 Paula Martins, Student, Universidade Federal De Juiz De Fora, Brazil

Innovation is an important factor for increasing competitiveness and recognition. Thus, this work aims to present the main advantages seen through innovation and related practices, based on a study of 27 companies and 20 Brazilian academic researchers.

025-1316 Convergence Hypothesis versus National Specificity in Technology Anticipation Capability
 Andrew Finger, Associate Professor, Centro Universitario Metodista Do Ipa, Brazil
 Ely Paiva, Associate Professor, Fundacao Getulio Vargas, Brazil
 Rafael Teixeira, Associate Professor, UNISINOS, Brazil
 Luciano Carvalho, Student, Fundacao Getulio Vargas, Brazil

This study analyzes data from companies located in different countries regarding their technology anticipation capability. We evaluate them according to two approaches: Convergence Hypothesis and National Specificity. We evaluate the data from 317 plants. The results suggest that there is a statistical difference among the plants analyzed.

40	Friday, 11:15 AM - 12:45 PM, Los Angeles (Floor 5) Session: New Supply Chain Optimization Models and Tools Chair(s): Xin Chen	<i>Track:</i> Production Planning and Scheduling
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025-0201 Stochastic Inventory model with Reference Price Effects
 Xin Chen, Associate Professor, University Of Illinois Urbana-Champaign, United States
 Peng Hu, Assistant Professor, Huazhong University Of Science & Technology, China
 Stephen Shun, Assistant Professor, Hong Kong University Of Science & Tech, Hong Kong

We analyze a single product periodic review inventory model in which pricing and production/inventory decisions are made simultaneously at the beginning of each period. Demands in different periods depend on not only the current selling price but also a reference price. The objective is to maximize the expected total profit.

025-0229 On the Inventory-Pricing Models with Batch Ordering
 Frank Chen, Associate Professor, The Chinese University Of Hong Kong, China
 Yi Yang, Student, The Chinese University Of Hong Kong, China
 Yun Zhou, Student, The Chinese University Of Hong Kong, China

In this paper, we study a joint pricing and inventory control problem in a finite-horizon, single-product, periodic-review setting with batch ordering. Demands in different periods are random variables that are independent of each other and their distributions depend on the post price exhibiting the additive form.

025-1135 Delayed Pricing Schemes of a Newsvendor
 Ming Zhao, OR Analyst, Sas Institute, United States
 Shengyuan Chen, Assistant Professor, York University, Canada
 Kai Huang, Assistant Professor, McMaster University, Canada

In this paper, we study a single product multi-period pricing problem. The problem is a nonlinear non-convex optimization problem, for which a local optimal solution is not necessarily a global optimum. We are able to find a global optimal decision structure and to transform the nonlinear non-convex problem to a shortest path problem accordingly.

41	Friday, 11:15 AM - 12:45 PM, Northwestern (Floor 6) Session: Return Management, Pricing and Competition Chair(s): Mehmet Altug	<i>Track:</i> Product Management
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025-0183 Optimal Return Policies under Competition

Jeff Shulman, Assistant Professor, University Of Washington, United States
 Anne Coughlan, Professor, Northwestern University, United States
 Canan Savaskan, Associate Professor, Southern Methodist University, United States

This paper investigates the pricing and restocking fee decisions of two competing firms selling horizontally differentiated products. We show that equilibrium restocking fees in a competitive environment can be higher than those charged by a monopolist.

025-0729 Competition for Demand via Price and Service Offerings

Pinar Keskinocak, Professor, Georgia Institute Of Technology, United States
 Shuangjun Xia, Student, Georgia Institute Of Technology, United States
 Pelin Pekgun, Assistant Professor, Georgia Institute Of Technology, United States

We study a one-manufacturer, two-supplier supply chain, where the suppliers compete for the manufacturer's demand via price and service offerings. We present the optimal base stock policy for the manufacturer and the fraction of demand to allocate to each supplier, and discuss suppliers' equilibrium decisions for price and service levels.

025-0106 Optimal Dynamic Return Management of Fixed Inventories

Mehmet Altug, Assistant Professor, George Washington University, United States

We consider a retailer that sells a fixed amount of inventory over a finite horizon. We assume that return policy is a decision variable which can be changed dynamically at every period. While flexible return policies generate more demand, it also induces more returns. We characterize optimal dynamic return policies.

025-1415 Sales Person Behavior in B2B Pricing

Itir Karaesmen, Assistant Professor, American University, United States
 Wolfgang Jank, Associate Professor, University Of Maryland, United States
 Wedad Elmaghraby, Associate Professor, University Of Maryland, United States

Using a data set on B2B transactions, we investigate the pricing decisions of sales people. We use clustering methods and statistical analysis to determine the type of information that is most influential in decision making.

42	Friday, 11:15 AM - 12:45 PM, Ballroom C (Floor 5)	<i>Track:</i> Healthcare Operations
	<i>Session:</i> Healthcare Analytics	
	<i>Chair(s):</i> Bruce Golden	

025-0621 Empirical Analysis of Outpatient Scheduling

Nikolay Osadchiy, Assistant Professor, Emory University, United States
 Diwas Kc, Assistant Professor, Emory University, United States

We examine patient scheduling at an outpatient clinic, where a significant number of scheduled appointments end up as no-shows. In this research, we explore factors that lead to the mismatch between demand and supply, and propose potential solutions to help the clinic manage its capacity utilization.

025-0685 Optimizing Resource Utilization from Provider Cancellations

Denise White, Consultant (Capacity Management) - Quality & Transformation Analytics, Cincinnati Children'S Hospital Medical Center, United States
 Robin Hamilton, Clinical Manager, Cincinnati Children'S Hospital Medical Center, United States

Hospitals are challenged to balance provider consistency in both inpatient and outpatient services. They commonly schedule inpatient services using time blocks and establish outpatient scheduling templates to provide consistency. We analyze methods for clinic overbooking to accommodate gaps in provider availability from service schedules and other factors causing clinic cancellations.

025-0406 Quantifying the Influence of Opinion Leaders on Technology Adoption in Healthcare: A Hierarchical Bayesian

Rema Padman, Professor, Carnegie Mellon University, United States
 Baohong Sun, Professor, Carnegie Mellon University, China
 Rahul Telang, Professor, Carnegie Mellon University, United States
 Haijing Hao, Student, Carnegie Mellon University, United States

This paper develops a hierarchical Bayesian learning model to examine self-learning effects and opinion leader effects on new mobile information technology adoption in healthcare based on observational data. Model estimates and simulation results show that opinion leaders have significant impact on their peer physicians' technology adoption behavior.

025-0238 An Empirical Analysis of the Effect of Residents on Emergency Department Treatment Times

David Anderson, Student, University Of Maryland, United States
 John Silberholz, Student, Massachusetts Institute Of Technology, United States
 Bruce Golden, Professor, University Of Maryland, United States
 Michael Harrington, Director of Patient Access, University Of Maryland, United States
 Jon Mark Hirshon, Associate Professor, University Of Maryland, United States

The residency teaching model is often cited as a possible source of inefficiency in hospitals. We examine data from emergency department patients at the University of Maryland Medical Center. Comparing patient treatment times when residents are present to when they are absent, we conclude that residents reduce treatment times.

43	Friday, 11:15 AM - 12:45 PM, Kansas City (Floor 5)	<i>Track:</i> Healthcare Operations
	<i>Session:</i> Managing Hospital Operations	
	<i>Chair(s):</i> Elham Torabi	

025-0636 Economic Dose Size for Hospital Pharmacy Dispensation

Claude Machline, Emeritus Professor, Centro Universitário São Camilo, Brazil

Hospital pharmacies traditionally prepare inpatient 24-hour unit doses. Whenever patient medical conditions change, medication returns to the pharmacy inventory, driving losses and costs. To reduce losses, hospital pharmacies are delivering shorter, as little as 2-hour, unit doses. The paper develops a mathematical model to find out the most economic dose size.

- 025-1713** Perceived and actual performance of US Long-term care facilities
 Hui-chuan Chen, Instructor, University Of Texas Arlington, United States
 Edmund Prater, Associate Professor, University Of Texas Arlington, United States
 Alan Cannon, Associate Professor, University Of Texas Arlington, United States

Skilled nursing facilities (SNF) in the US experienced Medicaid funding shortfalls of \$5.6 billion in 2010. This study examines the disparity between an SNF's perceptions of performance and its actual operational performance. The results can assist SNFs in effectively allocating resources to compensate for reduced reimbursement payments.

- 025-0701** A Genetic Algorithm Approach for Nurse Assignment in an Operating Suite
 Gino Lim, Associate Professor, University Of Houston, United States
 Elham Torabi, Student, University Of Cincinnati, United States
 Craig Froehle, Associate Professor, University Of Cincinnati, United States

When scheduling operating room nurses, our objective is to minimize nurse idle time and overtime while maximizing demand satisfaction subject to shift constraints and surgery requirements. Since the problem is NP-hard, finding optimality is difficult. We use a Genetic Algorithms approach to find a set of good schedules reasonably quickly.

44	Friday, 11:15 AM - 12:45 PM, Wisconsin (WI) (Floor 6)	<i>Track:</i> Healthcare Operations
	<i>Session:</i> Emergency Department & ICU Operations	
	<i>Chair(s):</i> Yann Ferrand	

- 025-0208** Disruption of Emergency Department Operations during EHR Implementation
 Craig Froehle, Associate Professor, University Of Cincinnati, United States
 Michael Ward, Assistant Professor, University Of Cincinnati, United States

Electronic health records (EHR) are increasingly implemented in hospitals despite uncertain operational effects. Combining time-and-motion with digital data capture, we compare operational performance pre- and post-EHR implementation at a suburban emergency department (ED). We measured delays in operational throughput, a reduction in data accuracy, and increased data missingness during implementation.

- 025-1159** Investigating Implementation of a Fast Track for Emergency Patients
 Yann Ferrand, Assistant Professor, Clemson University, United States
 Michael Magazine, Professor, University Of Cincinnati, United States
 Uday Rao, Associate Professor, University Of Cincinnati, United States
 Todd Glass, MD, Nemours Children's Hospital, United States

To improve patient flow in an emergency department, we investigate different ways to organize resources to set up a fast track process. We use discrete event simulation to evaluate patient wait time and length of stay, and physician utilization.

- 025-1782** The ICU Will See You Now: Efficient-Equitable Admission Control Policies for a Surgical ICU with Batch Arrival
 Muer Yang, Assistant Professor, University Of St. Thomas, United States
 Michael Fry, Associate Professor, University Of Cincinnati, United States
 Corey Scurlock, Director, Cardiothoracic ICU, Mount Sinai School of Medicine, United States

Intensive care units (ICU) are frequently the bottleneck in the hospital system. We examine admission policies for a surgical ICU where patients arrive in batches, using a Markov-decision process with the objective of balancing system efficiency and equity, motivated by the cardiothoracic-surgical ICU at Mount Sinai Medical Center.

45	Friday, 11:15 AM - 12:45 PM, River North (Floor 2)	<i>Track:</i> Finance and OM Interface
	<i>Session:</i> Equities, Real Options & Supply Chain Finances	
	<i>Chair(s):</i> Yih-Long Chang	

- 025-0557** A Supply Chain Analysis of the "Firm + Farms" model
 Kekun Wu, Student, City University Of Hong Kong, Hong Kong
 Yanzhi Li, Assistant Professor, City University Of Hong Kong, Hong Kong

We analyze the popular "firm + farms" business model, in particular for poultry business. Using a two-period dynamic model, we investigate the pros and cons of such a model to both the firm and farms. We identify conditions under which the model will prosper or also will lose its advantage.

- 025-1703** The Application of Real Options in E-business System Investment
 Ziping Wang, Assistant Professor, University Of Bridgeport, United States

This paper studies the performance of real options applied in the E-business system investment. We propose a model to address managerial flexibility in introducing the E-business system into a general business and seek an optimum time point for investment. The model can be solved by a dynamic programming.

- 025-1235** Financing for Technological Innovation Business Start-up: Real Option and Product Modularity
 Achara Chandrachai, Emeritus Professor, Technopreneurship and Innovation Management, Graduate School, Chulalongkorn, Thailand
 Kwanrat Suanpong, Student, Technopreneurship and Innovation Management Program, Chulalongkorn University, Thailand
 Kamales Santivejkul, Professor, Technopreneurship and Innovation Management Program, Chulalongkorn University, Thailand

We propose a real option approach to value the financing of technological innovation business start-up with consideration of modularity in new product development. The concern of investor or financier on survival, sustainability and grow of the start-up can be satisfied if new product is developed with option of corresponding module.

025-0781 Optimal decisions in the innovation adoption and diffusion of supply chain finance

David Wuttke, Student, Supply Chain Management Institute, EBS University for Business and Law, Germany

Constantin Blome, Assistant Professor, Universit   Catholique De Louvain, Belgium

Margarita Protopappa-Sieke, Assistant Professor, Supply Chain Management Institute, EBS University for Business and Law, Germany

The OM/Finance interface gains recently increasing attention. We analyse the Supply Chain Finance (SCF) innovation using a combination of rigorous case study research and modelling. By using sensitivity analysis on closed form solutions we learn interesting innovation mechanisms based on diffusion processes, optimal adoption timing decisions, and benefit allocation schemes.

46	Friday, 11:15 AM - 12:45 PM, Cook (Floor 3)	<i>Track:</i> Healthcare Operations
	<i>Session:</i> Technology and Software Applications in Healthcare	
	<i>Chair(s):</i> Paul St. Jacques	

025-0816 Deployment of Radio Frequency Identification Technology in Healthcare Organizations

Kannan Govindan, Associate Professor, University Of Southern Denmark, Denmark

Helena Carvalho, Student, -, Portugal

Virgilio Machado, Professor, -, Portugal

Susana Azevedo, Assistant Professor, -, Portugal

This paper aims to illustrate the deployment of RFID in Healthcare, more precisely in infant security systems. A case study about the experience of three hospitals and one RFID technology provider is presented to highlight the main architectural characteristics, functionality, and advantages associated to its deployment.

025-0073 Electronic Data Capture for a Longitudinal Study in Public Health - A Case Study

Krishna Sundar Diatha, Associate Professor, Indian Institute Of Management Bangalore, India

Shashank Garg, CEO, Handheld Solutions & Research Labs, India

Isha Garg, Professor, St. John's Medical College, India

A generic electronic data capture solution, deployable on mobile devices operating in disconnected mode and with various form-factors, has been developed for longitudinal studies in public health and disease surveillance. A practical implementation of data collection for a specific study involving mobile workflows and data management is being presented here.

025-1346 A novel approach for evaluating the risk of healthcare failure modes

Dong-Shang Chang, Professor, National Central University, Taiwan, Republic of China

Chang and Sun (2009) applied data envelopment analysis to enhance the assessment and capability of failure mode and effect analysis, FMEA. In this paper, a case study on healthcare FMEA is further investigated by advanced this approach as Slack-based Model. The managerial implication on risk management is addressed.

025-1427 An Electronic Process for Tracking Quality in an Anesthesiology Department

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

Many hospitals still use manual quality improvement processes. We implemented an electronic system of tracking, triaging, and resolving non-routine events in our anesthesiology related processes. This electronic system is useful in providing the framework for ensuring our quality related activities are best able to improve our patients' care experience.

47	Friday, 11:15 AM - 12:45 PM, Ballroom G (Floor 5)	<i>Track:</i> Service Operations
	<i>Session:</i> Service Recovery	
	<i>Chair(s):</i> Andrea Vinelli	

025-0453 Service Recovery: Impacts on Operational Performance

Enrico Contiero, Student, Universita Di Padova, Italy

Andrea Vinelli, Professor, Universita Di Padova, Italy

The research analyzes managerial and theoretical implications of service recovery in manufacturing companies. Based on case study evidence gathered directly by the authors the paper points out insights and findings on how service recovery practices impact on company's operational performance measurement systems, and suggests research and practical applications.

025-1295 The effects of service recovery justice and perceived switching costs on customer loyalty in E-tailing

Jin Qin, Associate Professor, University Of Science & Technology, China

This paper proposes a model of the effects of perceived justice, perceived switching costs and customer post recovery satisfaction on customer loyalty. Partial least squares structural equation modeling using SmartPLS2.0 is used to analyze data collected from a scenario based survey and test the relationship among constructs.

025-1493 To Twit or Not to Twit? Use Social Network Approach to Improve Service Recovery Outcomes

Run Niu, Assistant Professor, Webster University, United States

Ying Fan, Assistant Professor, University Of Colorado Colorado Springs, United States

Companies are increasingly using social network sites not only to communicate with their customers but to improve their service recovery operations promptly and proactively. We analyze tweets collected from multiple airlines' twitter accounts to identify the frequently complained service process. Our findings highlight significant factors that influence service recovery outcomes.

025-1757 Practice of service recovery in automobile assistance

Kleber Nobrega, Professor, Universidade Potiguar, Brazil

Judson Gurgel, Assistant Professor, Universidade Potiguar, Brazil

Rodrigo Leone, Professor, Universidade Potiguar, Brazil

This study investigated practices of service recovery in automobile assistance. With 13 variables identified in literature, 20 managers and 386 customers were interviewed in three separate companies. Differences were found between opinions of customers and managers, mainly related to communication, compensation, correction monitoring, information capturing, and refund.

48	Friday, 11:15 AM - 12:45 PM, Miami (Floor 5) <i>Session:</i> Service Analytics <i>Chair(s):</i> Peter Ball	<i>Track:</i> Service Operations
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025-0381 Applying the IS Success Model and Flow Theory to Study Online Investor Behavior

Xin Ding, Assistant Professor, University Of Houston, United States
Paul Hu, Professor, University Of Utah, United States

In this study, we consider online investor behavior as the result of both system characteristics and cognitive involvement. We extend and test constructs from information systems (IS Success Model) and psychology (Flow Theory) in an integrated theoretical framework.

025-0546 The Advantage of Forcing Basketball Players to Their Weak Side

David Collier, Professor, Florida Gulf Coast University, United States
James Bartholomew, Director of Basketball Operations, Florida Gulf Coast University, United States

The recent movie Moneyball starring Brad Pitt highlighted the importance of sports analytics in recruiting, evaluating, and retaining players based on their performance. Data envelopment analyses and statistics are used to evaluate two new defensive measures of defensive basketball efficiency. Future research will develop more comprehensive multiple criteria models of basketball team defensive efficiency.

025-1242 An Empirical Investigation of Supply Network Configurations for Different Product-Service Offerings

Mehmet Cakkol, Student, Cranfield University, United Kingdom
Anna Raffoni, Lecturer, Cranfield University, Italy
Jawwad Raja, Lecturer, Cranfield University, Great Britain
Mark Johnson, Senior Lecturer, Cranfield University, United Kingdom

The aim of this research is to explore how supply networks are configured to deliver different product-service offerings. We empirically investigate through an exploratory study the supply network of a truck manufacturer. We contribute to extant literature by providing an understanding of how different product-service offerings engage the supply network.

025-1300 Using discrete event simulation to evaluate engineering product service strategies

Peter Ball, Senior Lecturer, Cranfield University, United Kingdom

This paper examines simulation of the provision of a service through engineered products. It would seem logical that receiving increasing product performance information would enable higher levels of service performance to be achieved. This work shows how performance can be improved as well as conditions when it is not.

025-1655 Budget decisions of advertisement and operational improvements in service sector

Gurkan Akalin, Student, University Of Texas Arlington, United States

A mathematical approach on budgetary decisions in service sector between advertisement and operational improvements with the effects of customer word of mouth is considered. Incremental versus one time improvements under some conditions is tested and managerial insights are provided. This work is a continuation of previous research with additional aspects.

49	Friday, 11:15 AM - 12:45 PM, Minnesota (MN) (Floor 6) <i>Session:</i> OM Issues in Taiwan, Singapore, Hong Kong and China <i>Chair(s):</i> Chih-peng Chu	<i>Track:</i> OM in China/East Asia
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025-1824 Bicycle-Sharing System: Deployment and Effectiveness of Re-distribution

Jia Shu, Associate Professor, China, China
Mabel Chou, Associate Professor, National University Of Singapore, Singapore
Qizhang Liu, Senior Lecturer, National University Of Singapore, Singapore
Chung-Piaw Teo, Professor, National University Of Singapore, Singapore
I-Lin Wang, Associate Professor, National Cheng Kung University, Taiwan, Republic of China

We develop practical OR models to support decision making in the design and management of public car-sharing or bicycle-sharing systems. We develop a network flow model to predict the bicycle flow and estimate the number of trips supported by the system. We conduct numerical analysis using transit data in Singapore.

025-1759 A Synergistic Time-Dependent Timetable for the Kaohsiung Mass Rapid Transit System

Shou-Ren Hu, Associate Professor, National Cheng Kung University, Taiwan, Republic of China
Chih-peng Chu, Professor, National Dong Hwa University, Taiwan, Republic of China
Chao-Tang Liu, Student, National Cheng Kung University, Taiwan, Republic of China

A Mass Rapid Transit system must provide passengers with cost-affordable mobility, while meeting minimum service standards regulated by the government. The purpose of this research is to establish a time-dependent timetable model that dynamically adjusts the train schedule depending on the passenger spatio-temporal distribution demands under a daily operation basis.

025-1163 Software Development Outsourcing to China: Hong Kong Developer's Perspective

Chun-Hung Cheng, Associate Professor, Chinese Univ Of Hong Kong, Hong Kong
Kam-Fai Wong, Professor, Chinese Univ Of Hong Kong, Hong Kong

Many companies have been outsourcing software projects to software developers in China. However, their experience has been rarely documented. In this work, we try to understand their China experience by interviewing a few software developers from Hong Kong.

025-1559 Economic order quantity and pricing policy for a supply chain with price and stock sensitive demand

Jaydeep Balakrishnan, Professor, Haskayne School of Business, Canada
S. Van Enns, Associate Professor, University Of Calgary, Canada
M. Zaman Forootan, Student, Haskayne School of Business, Canada
Nikou Sabzvar, Student, University Of Calgary, Canada

Theoretical and simulation models for optimizing order quantity and pricing strategies for both independent and joint policies in a single stage SCM with one retailer and one manufacturer are developed. Assuming price and stock sensitive demand, this research discusses optimal results along with some sufficient conditions for optimality.

025-1820 Optimal Policies for Inventory Systems with Two Types of Product Sharing Common Hardware Platforms

Mabel Chou, Associate Professor, National University Of Singapore, Singapore
Chee-Khian Sim, Lecturer, Hong Kong Polytechnic Univ, Hong Kong
Xue-Ming Yuan, Research Scientist, Singapore Institute Of Manufacturing Technology, Singapore

We consider an inventory system whose products have a common hardware platform with either software 1 or 2. The optimal policy to determine the proportion of an order to be installed with software 1 or 2 is analytically obtained in the single and multiple period scenarios, respectively.

51	Friday, 01:30 PM - 03:00 PM, Scottsdale (Floor 5)	<i>Track:</i> Supply Management
	<i>Session:</i> New Research in Strategic Sourcing	
	<i>Chair(s):</i> Damian Beil Izak Duenyas	

025-0896 Sourcing Strategies under Supply Yield Uncertainty

Lingxiu Dong, Associate Professor, Washington University St Louis, United States
 Nan Yang, Assistant Professor, Washington University St Louis, United States
 Guang Xiao, Student, Washington University St Louis, United States

We consider a one-buyer-multi-supplier system in the presence of supply yield uncertainty. We explore the impact of various supply contractual arrangements and different yield uncertainty profiles on the equilibrium supply chain performance.

025-0726 Deploying Test Auctions to Assist with Supplier Qualification Decision-Making

Brendan See, Student, University Of Michigan Ann Arbor, United States
 Damian Beil, Associate Professor, University Of Michigan Ann Arbor, United States
 Izak Duenyas, Professor, University Of Michigan Ann Arbor, United States

We evaluate when a buyer can benefit from holding multiple auctions when the supply base consists of qualified and not-yet-qualified suppliers who can be qualified at a cost. The main trade-off occurs between increased supplier competition and revealing supplier cost information. We also incorporate a reserve price and TIOLI offer.

025-1323 Sourcing for Supplier Effort and Competition: Design of Supply Base and Pricing Mechanism

Cuihong Li, Assistant Professor, University Of Connecticut Storrs, United States

We study the sourcing strategy along two dimensions: supply base design and pricing mechanism, considering their impact on supplier competition and cost-reduction effort. The supply base design concerns the number of suppliers and the capacity to be invested in each supplier. The pricing mechanism determines the timing of price decisions.

025-1708 Sourcing Flexibility, Spot Trading, and Procurement Contract Structure

David Simchi-Levi, Professor, Massachusetts Institute Of Technology, United States
 Pamela Pei, Research Faculty, CEPAC, United States
 Tunay Tunca, Associate Professor, University of Maryland, United States

We analyze the structure and pricing of supply option contracts under spot trading by jointly endogenizing the determination of three major design dimensions: sales contracts versus options contracts; flat-price versus volume-dependent contracts; volume discounts versus volume premia. We provide links between production and spot market characteristics, contract design, and efficiency.

52	Friday, 01:30 PM - 03:00 PM, Lincolnshire II (Floor 6)	<i>Track:</i> Empirical Research in OM
	<i>Session:</i> Empirical Research on Risk and Inventories	
	<i>Chair(s):</i> Adrian Choo	

025-1345 Industry Competition and Manufacturing Inventory - An Exploratory Study

Chaodong Han, Assistant Professor, College of Business and Economics, United States

Theoretical models have been ambiguous in predicting the effect of industry competition on inventory holdings of manufacturing firms. Using U.S. Census data on manufacturing industries, this study explores the implications of industry competition on manufacturing inventory at all three stages (i.e., raw materials, work-in-process and finished goods inventories).

025-1154 A Study on Transportation Modal Selection and Manufacturing Inventory Levels in Global Supply Chains

Jian-yu (Fisher) Ke, Student, University Of Maryland, United States
 Robert Windle, Professor, University Of Maryland, United States

This study empirically examines the relationship between international transportation mode and manufacturing inventory levels in global supply chains and develops the decision rules for modal selection for each manufacturing industry. In addition, we find that the factors associated with higher inventory carrying costs contribute to higher usage of air shipping.

025-0711 Communicating Risk in Shipping Operations: A Multilevel Empirical Analysis

Martha Grabowski, Professor, Le Moyne College, United States
 Adrian Choo, Assistant Professor, Georgia State University, United States

Organizations mitigate risks by communicating potential perils to workers. This study investigates if risk communication is more effective in enhancing safety in vessels with workers who also feel more efficacious collectively. Findings also show organizational communication affects how people rely on their individual knowledge, which influences individual/group efficacy and performance.

025-1209 Risk Management in Major Plant Engineering and Construction Projects - Results from an Empirical Research

Johannes Ixmeier, Student, Friedrich-Alexander Universitat Erlangen-Nurnberg, Germany
 Kai-Ingo Voigt, Professor, Friedrich-Alexander Universitat Erlangen-Nurnberg, Germany
 Lothar Czaja, Student, Friedrich-Alexander Universitat Erlangen-Nurnberg, Germany

Due to the fact that companies operating in major plant engineering and construction are facing specific branch characteristics, most firms are confronted with a complex and dynamic risk situation. Based on several empirical research projects conducted between 2010 and 2011, we analyze the main causes and effects of project risks.

53	Friday, 01:30 PM - 03:00 PM, Ohio State (Floor 6)	<i>Track:</i> Humanitarian Operations and Crisis Management
	<i>Session:</i> Challenges in Humanitarian Supply Chains	
	<i>Chair(s):</i> Maria Besiou	

025-1140 Improving Life Saving in Disaster Relief Operations

Yufei Yuan, Professor, Mcmaster University, Canada
 Yiping Jiang, Student, Southeast University, China
 Lindu Zhao, Professor, Southeast University, China
 Kai Huang, Assistant Professor, Mcmaster University, Canada

In this paper, we consider integrating the resource allocation and emergency distribution in disaster relief operations. We define utility functions to model the effectiveness and efficiency of life saving, and maximize the total life saving utility in the objective function. We also use a time space network to capture the dynamic features.

025-1005 The environmental impact of humanitarian operations

Luk Van Wassenhove, Professor, INSEAD, France
 Jurgita Balaisyte, Student, INSEAD, France
 Ruth Carrasco-Gallego, Assistant Professor, College of Industrial Engineering, Technical University of Madrid (UPM), Spain

The negative environmental impacts of relief operations arise at the different stages of relief supply chain: from procurement, stock positioning, transportation to waste management. A growing number of humanitarian agencies are attempting to integrate environmental considerations in their activities. We map the value chain and identify its economic, environmental and social issues.

025-0716 Scenario analysis for emergency inventory prepositioning of medical supplies

Tezar Saputra, Student, Vrije Universiteit Amsterdam, Netherlands
 Karin de Smidt-Destombes, Assistant Professor, Vrije Universiteit Amsterdam, Netherlands
 Sander de Leeuw, Associate Professor, Vrije Universiteit Amsterdam, Netherlands

Humanitarian relief organizations preposition inventory to fulfill disaster needs. Several items used in disaster relief are also used in ongoing development programs. Based on a case we describe a scenario analysis of inventory policies for emergency prepositioning of medical items considering development program vs. disaster needs and different transport modalities.

54	Friday, 01:30 PM - 03:00 PM, Purdue (Floor 6)	<i>Track:</i> Marketing and OM Interface
	<i>Session:</i> Retail Pricing Problems in Operations Management	
	<i>Chair(s):</i> Goker Aydin	

025-0085 Sponsored Search Marketing: Dynamic Pricing and Advertising for an Online Retailer

Shanshan Hu, Assistant Professor, Indiana University Bloomington, United States
 Shengqi Ye, Student, Indiana University Bloomington, United States
 Goker Aydin, Associate Professor, Indiana University Bloomington, United States

We consider an online retailer that dynamically updates its price and its ad spending on sponsored searches. The retailer's ability to update its ad spending may have surprising effects. For example, larger inventory levels might lead to higher prices, if such inventory levels also lead to aggressive ad spending.

025-0581 A Simple Heuristic for Joint Inventory and Pricing Problems with Lead Time

Fernando Bernstein, Professor, Duke University Durham, United States
 Kevin Shang, Associate Professor, Duke University Durham, United States
 Yang Li, Student, Duke University Durham, United States

We study a joint inventory and pricing problem in a single-stage system with positive lead-time. This problem is, in general, intractable. We develop a simple heuristic which involves a base-stock replenishment policy and a myopic pricing policy. This heuristic enables us to explore the lead-time impact on the joint decisions.

025-0596 Pricing Policy and Extended Warranty

Kwei-Long Huang, Assistant Professor, National Taiwan University, Taiwan, Republic of China
 Hsing-Ping Kuo, Student, University Of North Carolina Chapel Hill, United States
 Chia-Wei Kuo, Assistant Professor, National Taiwan University, Taiwan, Republic of China

We consider a manufacturer sells a product through a retailer. The retailer determines the pricing policy - posted pricing or negotiation, and whether to bundle the product with extended warranty. Our result shows pricing policy has significant effect on whether the retailer bundles the product with extended warranty.

025-0718 Conditional Promotions and Consumer Overspending

Hyun-soo Ahn, Associate Professor, University Of Michigan Ann Arbor, United States
 Thunyarat (Bam) Amornpetchkul, Student, University Of Michigan Ann Arbor, United States
 Ozge Sahin, Assistant Professor, Johns Hopkins University, United States

Conditional promotions (e.g. spend \$50 get 30% off) are effective when some consumers are deal-prone (obtain transaction utility from purchasing at discount). We compare percent-off and dollar-off discount scheme, and show that both can lead to consumer overspending. Moreover, depending on the product nature, one scheme may outperform the other.

55	Friday, 01:30 PM - 03:00 PM, Great America II (Floor 6)	<i>Track:</i> OM Practice
	<i>Session:</i> Applied New Product Development: the Industry Perspective	
	<i>Chair(s):</i> Shantanu Bhattacharya	

025-1270 Analysis of PMBOK (2008) from the perspective of Critical Chain

João Mario Csillag, Professor, Fundacao Getulio Vargas, Brazil
 João Luis Quaglia, Student, Fundacao Getulio Vargas, Brazil
 Chen Yen-Tsang, Student, Fundacao Getulio Vargas, Brazil
 Daniel Galelli, Student, Fundacao Getulio Vargas, Brazil
 José Carlos Oyadomari, Professor, Universidad Presbiteriana Mackenzie, Brazil
 Ronaldo Dultra-de-Lima, Student, Fundacao Getulio Vargas, Brazil

The PMBOK is a set of best practice in project management. The Critical Chain, from Goldratt, examines the projects in a global outcome perspective (time, budget and scope). This paper aims to relate the practices of the PMBOK with the Critical Chain, looking for a common target, the project's success.

025-0556 Joint Product Improvement by Client and Customer Support Center
Sameer Hasija, Assistant Professor, INSEAD, Singapore
Shantanu Bhattacharya, Associate Professor, INSEAD, Singapore
Alok Gupta, Professor, University Of Minnesota, United States

We study the role of different contract types in coordinating the joint product improvement effort of a client and a customer support center. Our research provides a systematic theoretical framework that accounts for the prevalence of gain-share contracts in the IT industry's joint improvement efforts.

025-1712 Distribution of Novel Products
Vish Krishnan, Professor, University Of California San Diego, United States
Karthik Ramachandran, Assistant Professor, Southern Methodist University, United States

Motivated by the failed - and later, successful - attempts of a large consumer electronics manufacturer, we model the problem of channel selection for novel new products. Novel products are often initially misunderstood by consumers. We focus on distribution channels that also educate consumers on their needs.

56	Friday, 01:30 PM - 03:00 PM, Dupage (Floor 3)	<i>Track:</i> Scheduling and Logistics
	<i>Session:</i> Integration of Dynamic Supply Chain Operations and Sustainability	
	<i>Chair(s):</i> Sean Zhou	

025-1650 Carbon Taxes and Supply Chain Emissions
Xi Chen, Student, Industrial and Systems Engineering, United States
Saif Benjaafar, Professor, Industrial and Systems Engineering, United States

We study a serial supply chain consisting of multiple firms. We find that imposing a carbon tax on each firm's own emissions may increase the supply chain's total emissions. We show that this effect can be eliminated by taxing firms on not only their emissions but also their supplier's emissions.

025-1623 Approximation Algorithms for Stochastic Remanufacturing Inventory Systems
Sean Zhou, Assistant Professor, The Chinese University of Hong Kong, Hong Kong

We study approximation algorithms for dynamic remanufacturing systems with stochastic product returns and customer demands. The key feature is that demands and product returns in different periods are correlated. We will evaluate decisions and construct approximation policies and algorithms based on alternative cost accounting schemes.

025-0999 Developing a Theoretic Framework and Propositions for the Innovation of Third-Party Logistics Service Provider
Liangang Cui, Student, Jonkoping University, Sweden
Shong-lee Su, Professor, Soochow University, Taiwan, Republic of China
Susanne Hertz, Professor, Jonkoping University, Sweden

Based on a recent chronological case study results, literature review, and expert validation, a theoretic framework and the propositions regarding the innovation of Third-Party Logistics (3PL) firms are developed. The framework and propositions developed in this paper will provide a theoretic foundation for the further theory development of 3PL innovation.

025-0956 The Delivering Time and Cost strategic proposition for Thai Automotive Logistics Operations
Vichayanan Rattanawiboonsom, Assistant Professor, Naresuan University, Thailand

The current stock-push vehicle supply model in the Thai automotive industry which fulfills the majority of orders from existing stock appears to be no longer a viable proposition. Cost pressure from rising stock and inventory levels coupled with the high discounts needed to sell these vehicles have forced vehicle manufacturers to rethink their order fulfillment strategy shifting to one favouring stock less build to order systems. More responsive order fulfillment at the vehicle manufacturer level, however, will not only require flexible and responsive component supply and vehicle assembly, but will also have wide ramifications for all logistics operations in the Thai automotive supply chain. Based on the finding of delivering time programme, identified in this paper, A comparison will be made of inbound, outbound and other transportation logistics, leading to the development of a strategic framework for future Thai automotive logistics operations.

57	Friday, 01:30 PM - 03:00 PM, Ballroom A (Floor 5)	<i>Track:</i> Sustainable Operations
	<i>Session:</i> Energy	
	<i>Chair(s):</i> Dana Johnson	

025-1548 Comparing relative GHG emissions in the bio-ethanol supply chain: a case study in Brazil
Celso Junior Lopes, Student, Program of Logistic Systems Engineering, Brazil
Hugo Yoshizaki, Associate Professor, Universidade De Sao Paulo, Brazil

This work evaluated the relative contributions of different activities in the bio-ethanol supply chain in Brazil. Emissions from five regions were calculated using the Renewable Transport Fuel Obligation (RTFO) method. Agricultural production has a more important contribution than final product transportation, representing 51% to 62% of the supply chain emission.

025-0832 Woody Forest Residue Supply Chain for Biofuels
Fengli Zhang, Student, Michigan Technological University, United States
Robert Froese, Associate Professor, Michigan Technological University, United States
Dana Johnson, Professor, Michigan Technological University, United States

The biofuels industry is dependent on the least expensive source of feedstock. An inexpensive source is woody forest residue. There are several issues associated with removal of woody forest residue beyond the obvious sustainable forest management practices. This paper describes the framework for developing a woody forest residue supply chain.

025-1180 The value of energy storage on a smart grid
Stephen Lawrence, Associate Professor, University Of Colorado Boulder, United States

We seek to answer fundamental questions about the value and use of energy storage on evolving electricity smart grids. We investigate the marginal value of energy storage and its optimal location as it relates to renewable energy technologies and the provision of ancillary services such as regulation and energy reserves.

025-0253 Energy Portfolio Management with Abandonment Option Over an Infinite Horizon

Zhen Liu, Assistant Professor, Missouri University Of Science And Technology, United States

We study the optimal time to abandon a plant of a firm with a portfolio of plants to maximize the expected profit over an infinite horizon. Under geometric Brownian motion, we formulate the problems as mixed optimal stopping/control problems, and characterize the optimal strategies in closed-form.

58	Friday, 01:30 PM - 03:00 PM, Denver (Floor 5)	<i>Track:</i> Sustainable Operations
	<i>Session:</i> Green Supply Chains and Green Sourcing	
	<i>Chair(s):</i> Iuri Gavronski	

025-1112 Sustainable capabilities for green supply management

Iuri Gavronski, Assistant Professor, UNISINOS, Brazil
 Robert Klassen, Professor, University Of Western Ontario, Canada
 Stéphane Vachon, Assistant Professor, University Of Western Ontario, Canada

Building on resource-based rationale and the cumulative capabilities theory, we argue that internal sustainable practices (ISP) pave the way and build capabilities that are later deployed in green supply management (GSM). We expect ISP and GSM to be positively related. We provide empirical evidence from a survey on manufacturing plants.

025-1126 What motivates greener operations and supply? A stakeholder approach

Iuri Gavronski, Assistant Professor, UNISINOS, Brazil
 Vitor Brock, Student, UNISINOS, Brazil

We posit that each stakeholder group have distinct influence on the adoption of environmental practices in operations and supply management. We investigate four major stakeholder groups: regulatory stakeholders; market stakeholders; internal stakeholders; and competitive stakeholders. We empirically test this relationship with a survey in the Brazilian metalworking and electronic industry.

025-1405 Examining the characteristics of environmentally strategic sustainable sourcing in supply chains

Erika Marsillac, Assistant Professor, Old Dominion University, United States
 David Cook, Associate Professor, Old Dominion University, United States

Within the framework of corporate social responsibility, strategic sourcing has been used as a tool to meet many organizational objectives. One common CSR goal is minimizing negative environmental impacts that result from production, product/service use, and post-life placement. This research will examine and analyze supply chain environmentally strategic sustainable sourcing.

025-1336 Sustainable supplier development, partnership satisfaction and supplier performance

Su-Yol Lee, Assistant Professor, Chonnam National University, Korea, Republic of (South Korea)
 Robert Klassen, Professor, University Of Western Ontario, Canada

Improving supplier economic, environmental and social performance is the central goal of sustainable supplier development. Our study empirically examine the direct and indirect effects of buying firms' sustainable supplier development practices on supplier sustainability performance by considering relationship satisfaction as a mediating variable. The results strongly support these relationships.

59	Friday, 01:30 PM - 03:00 PM, Ballroom H (Floor 5)	<i>Track:</i> Vendor and Supply Contracts
	<i>Session:</i> Trust & Cultural Issues in Supply Chain Relationships	
	<i>Chair(s):</i> Omar Elwakil	

025-0057 The Evolution of Inter-organizational Trust in VMI Relationships

Martin Dresner, Professor, University Of Maryland, United States
 Yuliang Yao, Associate Professor, Lehigh University, United States
 Koray Ozpolat, Assistant Professor, University Of Rhode Island, United States

Using survey data collected from distributors that use VMI, we find that longer relationships are associated with lower levels of distributor trust in the manufacturer. Erosion of trust over time is fully mediated by the distributors' experience of psychological-contract-violation. Good inventory-performance may not be sufficient to maintain trust in VMI-relationships.

025-0846 The Effect of Cultural Identity on Contractual Arrangements

Dina Ribbink, Assistant Professor, University Of Western Ontario, Canada
 Curtis Grimm, Professor, University Of Maryland, United States
 Omar Elwakil, Student, University Of Maryland, United States

We investigate whether cultural identity affects procurement contracts in a data set collected from a multinational Fortune 500 firm. Firms engaging in buyer-supplier interactions have been typically described as holistic, rational actors driven by transaction cost considerations. We find the role of cultural identity is a salient factor to consider.

025-1247 To what extend does it pay to be supplier of a powerfull enterprise? The Petrobras Case

Cristiane Villar, Student, Fundacao Getulio Vargas, Brazil
 Janaina Siegler, Student, Fundacao Getulio Vargas, Brazil
 Aline Fernandes, Student, Fundacao Getulio Vargas, Brazil
 Jalba Miniussi, Student, Fundacao Getulio Vargas, Brazil

Anecdotal evidences show that some multinational enterprises deploy aggressive suppliers development programs arguing that being part of its vendor list is a competitive advantage for the supplier. Building on TCT, Social Exchange Theory and through case studies, this research aims to investigate to what extend does it really pay.

025-1416 The Use of floor presence in the Public Sector: A Case in the City of Rio Brilhante/ MS

Sergio Brun, Student, UFGD/UFSC, Brazil
 Antonio Carlos Vaz Lopes, Student, Univ. Federal Da Grande Dourados, Brazil
 Evone Bezerra Alves, Student, UFGD, Brazil
 Jouliana Jordan Nohara Nohara, Student, Universidade Nove De Julho, Brazil
 Rolf Erdmann, Professor, Universidade Federal De Santa Catarina, Brazil

The Brazilian government has improved its system of bidding on the need for greater flexibility and increase the competitiveness of public administration contracts. This article aims to analyze the use of the type floor presence in Brazil. Data were organized and presented in the focus of the last two years.

60	Friday, 01:30 PM - 03:00 PM, Illinois (IL) (Floor 6) <i>Track:</i> General Track <i>Session:</i> Service Development, Energy, Quality, Process Improvement <i>Chair(s):</i> David Hinds
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025-1129 Comparative Analysis of Energy Sources in Puerto Rico

Karla Iglesias, Student, University Of Puerto Rico, Puerto Rico
 Mayra Mendez-Pinero, Assistant Professor, University Of Puerto Rico, Puerto Rico

Countries are looking for alternatives to produce energy but, which one is the best? Which one contributes more to the energy generation objectives of a country? A methodology is being developed using AHP to compare renewable and non-renewable sources of energy in terms of economical, technical, environmental, and social-political issues.

025-0869 Antecedents to successful delivery of integrated product-services: what have we discovered so far?

Anna Raffoni, Lecturer, Cranfield University, Italy
 Björn Claes, Lecturer, The Open University Business School, United Kingdom

Servitization, the integration of services into product-based offerings, is witnessing an upsurge of interest. Through meta-analytical techniques employed on 108 case studies described in 27 papers, we synthesize and extend literature by providing a comprehensive overview of the factors that account for companies' ability to successfully deliver a servitized offering.

025-1657 Quality Culture Development: The Next Stage of Quality Management Practices

Ping Wang, Associate Professor, Tianjin University, China

Culture has been viewed as the key inhibitor preventing a variety of quality management initiatives from successful implementation. In this study, quality culture is defined, and the future of quality management is to develop an ideal quality culture. Tools and steps to diagnose and to develop quality culture are provided.

025-0831 Theoretical Foundations and Constructs for Process Improvement

David Hinds, Assistant Professor, Nova Southeastern University, United States

A theoretical framework for process improvement is suggested based on change theories associated with management and organizational research. Process improvement programs such as Lean and Six Sigma are viewed as change mechanisms and related research constructs are defined for use in the formulation of hypotheses for future empirical testing.

61	Friday, 01:30 PM - 03:00 PM, Ballroom B (Floor 5) <i>Track:</i> Supply Chain Management <i>Session:</i> Cooperation in Supply Chains <i>Chair(s):</i> Yan Cimon
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025-0864 Supplier Selection Using Fuzzy Heuristic Method (AET)

Rakesh Verma, Assistant Professor, National Institute of Industrial Engineering (NITIE), India
 Saroj Koul, Professor, Op Jindal Global University, India

Purchasing is the primary point of contact with most supply-chain partners and thus among the most important activities. We apply a proposed fuzzy heuristic method (AET) as a combination of fuzzy AHP (Fuzzy Analytical Hierarchy Procedure), Fuzzy Entropy, and Fuzzy TOPSIS (Technique for Order Preference by Similarity to an Ideal Solution) to select the best supplier. An example is considered to demonstrate the concept of general choice of supplier in the supply chain management.

025-0164 Exploring Managerial Response to Inventory Ordering When Faced with Supply and Demand Disruption Probabilities

Maria Ibanez, Student, University Of Chicago, United States
 Mark Cotteleer, Associate Professor, Marquette University, United States

This study explores managerial choice related to inventory orders under supply-side and demand-side uncertainty. The Behavioral Economics literature indicates poor decision-making under uncertainty. We extend theory in Behavioral Operations to explore how managers alter inventory decisions at different disruption probabilities under more realistic planning scenarios than typically seen.

025-0351 Offshore outsourcing in service industries

Siddhartha Syam, Associate Professor, Marquette University, United States
 Xiang Wan, Assistant Professor, Marquette University, United States

Offshore outsourcing is a widely prevalent phenomenon in all developed economies. Initially, the major thrust of offshore outsourcing was in manufacturing but today this phenomenon encompasses many services. This paper develops a multi-criteria model for service offshore outsourcing.

025-1495 How does public policy matter in cross-border networks?

Yan Cimon, Associate Professor, Universite Laval, Canada
 Fatou Thiam, Instructor, Cirrelt, Canada
 Rached Halloul, Student, Cirrelt, Canada

This paper examines the impacts of public policy on cross-border networks between Canada and the USA. A special focus on the auto industry, the aerospace and defense industry, and the exit strategies of various firms helps categorizing the impact of public policy on inter- and intra-firm cross-border networks. Implications for future research are drawn.

025-0097 Cooperation strategy in dual-channel supply chain under disruption with revenue-sharing contract

Yu-lin Zhang, Professor, Southeast University, China
 Xiao-ming Zhao, Student, Southeast University, China
 Han Yong, Professor, Southeast University, China
 Jiang Xiaogan, Professor, Southeast University, China

This paper develops a cooperation decision model in a two-echelon dual channel supply chain consisting of one manufacturer and one retailer under a delivery disruption. Little attention has been given to disruption management in a dual-channel supply chain although disruption management has long been a key research issue in supply chain management. Generally, the manufacturer gains profits from the e-commerce direct channel, but in practice he can hardly deliver products bought online to final customers under delivery disruption induced by interrupted traffic. However, the retailer is near terminal customers and almost is not affected by the disruption. In this paper, we examine how to realize cooperation between the manufacturer and the retailer to solve this problem. We first study the scenario where the manufacturer and the retailer don't cooperate with each other after the disruption accrued. In the scenario without cooperation, with the scale of online demand transferring to the retail channel increasing, the retailer's optimal retail price, the optimal wholesale price set by the manufacturer and the optimal profits of the retailer and the manufacturer will increase. Then we further assume that the manufacturer cooperates with the retailer by a revenue-sharing contract, that the retailer takes charge of the delivery and shares the revenue in the direct channel. In the scenario with cooperation, the revenue sharing proportion does not affect the optimal retail price in the retail channel and the optimal direct price in the direct channel. However, the optimal wholesale price and the manufacturer's optimal profits will decrease and the retailer's optimal profits will increase with the proportion increasing. Finally, we derive conditions under which the win-win cooperation between the manufacturer and the retailer can be realized. The results shows that, when the scale of online demand transferring to the traditional retail channel without cooperation and the revenue sharing proportion meet some condition, the manufacturer and the retailer will agree to cooperate with each other. We also find that, the revenue-sharing proportion on cooperation is affected by the online customers' loyalty. If the customers in the direct channel are loyal to the manufacturer faithfully, the manufacturer will have huge advantage in the negotiation with the retailer. The retailer will agree to cooperate with the manufacturer even he shares infinitesimal revenue of the direct channel.

62	Friday, 01:30 PM - 03:00 PM, Houston (Floor 5) <i>Session:</i> Quality and Reliability in Supply Chains <i>Chair(s):</i> Washington Luiz Soares	<i>Track:</i> Supply Chain Management
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025-0014 Contract Types and Supplier's Incentives for Quality Improvement

Jeannette Song, Professor, Duke University Durham, United States
 Qiying Hu, Professor, Fudan University, China
 Jiguang Chen, Student, Fudan University, China

We study the effect of commonly used contract types on supplier's quality investment. We show that, under full information, subsidy for quality improvement (S) is equivalent to specified quality target (T). Under asymmetric information, S is more effective than T. Moreover, penalty for the nonconforming unit enhances all contracts.

025-0126 The vision for Lean Six Sigma to reduce logistics costs in practices by Modal Shift

Washington Luiz Soares, Student, Unisantia, Brazil
 Getulio Akabane, Student, Unia- Anhanguera, Brazil
 Hamilton Pozo, Student, Faccamp - Faculdade Campo Limpo Paulista, Brazil

The Lean Six Sigma (LSS) is one philosophy important for helping you map out the activities of the service chain on the organizational point of view of automakers companies with best practices of modal shift. The proposal involves for managing value responsibility in each service for reducing inventory in transit.

025-1784 Business Interoperability for Collaborative Platforms with Axiomatic Design for LARG Ecosystems

Izunildo Cabral, Student, UNIDEMI - Faculdade de Ciências e Tecnologia da UNL, Portugal
 Antonio Grilo, Assistant Professor, UNIDEMI - Faculdade de Ciências e Tecnologia da UNL, Portugal

This paper describes a developing methodology to enable the detailed design of ICT-based platforms that are able to deliver high levels of business interoperability, in context of lean, agile, resilient and gree industrial networked ecosystems, grounded on the axiomatic design (AD) theory.

025-1044 Centrality and Dispersed Manufacturing Networks

Adrian Tan, Student, Wilfrid Laurier University, Canada
 Hamid Noori, Professor, Wilfrid Laurier University, Canada

In the novel Dispersed Manufacturing Network (DMN) perspective, companies gather in transitory collaborative network groups to achieve goal-specific supply management objectives. Centrality (e.g., degree, closeness and betweenness etc.) is related to networks' functional characteristics. In this presentation, centrality concepts are used to analyze the organization and performance of dispersed networks.

63	Friday, 01:30 PM - 03:00 PM, Watertower (Floor 10) <i>Session:</i> Travel and Tourism Research <i>Chair(s):</i> Bo van der Rhee	<i>Track:</i> OM in Travel, Tourism, and Hospitality Industries
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025-1183 A fuzzy EMSR model with uncertain service quality attributes

Xiang Zhang, Associate Professor, Beijing Institute Of Technology, China

In this paper, we propose a fuzzy EMSR model to show that the seat control strategy of airline company is influenced by and associated with service attributes which are fuzzy in nature. The proposed new model can account for more passengers' recognition and air service features.

025-0934 USA touristic cluster mapping: finding hotels performance differences in and out

Angel Peiro-Signes, Assistant Professor, Universitat Politcnica de Valencia-Cornell University, Spain
 Maria-del-Val Segarra-Ona, Associate Professor, Universitat Politcnica de Valencia-Cornell University, Spain
 Lluís Miret-Pastor, Assistant Professor, Universitat Politcnica de Valencia, Spain
 Rohit Verma, Professor, Cornell University, United States

USA tourism clusters are identified using quantitative methods. We analyzed five-year economic data from PKF database to compare the economic performance between hotels located in touristic clusters and those which are outside. Results show that main economic indicators are higher in hotels inside the tourism clusters than in those outside.

025-0708 Adoption of Medical Travel Options in Employer-Based Coverage

Corinne Karuppan, Professor, Missouri State University, United States
 Don Leibert, Assistant Professor, Missouri State University, United States

Skyrocketing healthcare costs have fueled the growth of medical tourism. Once confined to cosmetic surgery patients and the uninsured, its market now includes insured healthcare consumers and progressive employers. Based on a nationwide survey, we identify the cost-benefit dynamics leading to the adoption of medical travel options in employer-based coverage.

025-0093 Virtual Queuing at Airport Security Lanes

Robert de Lange, Entrepreneur, MyDivvi, Netherlands
 Ilya Samoilovich, Consultant, Caggimini, Netherlands
 Bo van der Rhee, Associate Professor, Nyenrode Business University, Netherlands

Airports continuously seek opportunities to reduce the security costs without negatively affecting passenger satisfaction. We investigate the possibilities of virtual queuing at airport security lanes, using a simulation study designed in collaboration with a large International Airport. We find they can save \$1M yearly without negatively affecting waiting times.

64	Friday, 01:30 PM - 03:00 PM, Ballroom F (Floor 5)	<i>Track:</i> Product Innovation and Technology Management
	<i>Session:</i> Collaborative Product Development	
	<i>Chair(s):</i> Steve Melnyk	

025-1392 Managing Knowledge for the Joint Development of New Products

Cheryl Gaimon, Professor, Georgia Institute Of Technology, United States
 Guru Ozkan, Assistant Professor, Clemson University, United States

We introduce a stochastic game on knowledge sharing (KS) and knowledge development (KD) strategies for two NPD firms. First, leader sets allocations of profit, then firms decide on KS for joint development of a new product. Next, firms jointly pursue KD and launch the product. Insights include impact of uncertainty.

025-1466 Asymmetrical collaboration expectations and supply chain innovation performance: a theoretical analysis

Steve Melnyk, Professor, Michigan State University, United States
 Stanley Fawcett, Professor, Air Force Institute Of Technology, United States
 John Ettlie, Professor, Rochester Institute Of Technology, United States
 Hugo DeCampos, Student, Michigan State University, United States

The degree of inter-firm collaboration pursued between two firms is a function of their respective marginal costs and benefits for collaborating. Two firms may have asymmetrical marginal cost and benefit curves thus leading to asymmetrical collaboration expectations. We argue that persistence of this asymmetry may impact inter-firm innovation performance.

025-0698 Managing International Networks for Emerging Technologies

Tomás Harrington, Associate Professor, University of Cambridge, United Kingdom

One challenge concerning the commercialization of new technologies is that there is no defined strategy that a firm can follow. This research informs development of approaches to the mapping and analysis of value creation and capture to support the design of appropriate networks for the commercialization of new technologies.

025-1630 The role of structural and social elements in innovation projects: Knowledge creation and technical performance

Morgan Swink, Professor, TCU, United States
 Jung Young Lee, Assistant Professor, Northern Illinois University, United States

The purpose of this research is to examine the relationship between intellectual capital elements and the performance of innovation projects. Using the final sample of 212 innovation projects in manufacturing companies, this research empirically shows that structural elements and social elements influence technical performance and knowledge creation performance differently.

65	Friday, 01:30 PM - 03:00 PM, Los Angeles (Floor 5)	<i>Track:</i> Product Innovation and Technology Management
	<i>Session:</i> Sustainability and Innovation	
	<i>Chair(s):</i> Andrea Vinelli	

025-0844 The relationship between sustainability and innovation practices in the fashion industry supply chain

Antonella Moretto, Student, Politecnico Di Milano, Italy
 Andrea Vinelli, Professor, Universita Di Padova, Italy
 Maria Caridi, Associate Professor, Politecnico di Milano, Italy
 Gianluca Spina, Professor, Politecnico di Milano, Italy
 Laura Macchion, Student, Universita Degli Studi Di Padova, Italy

Combining the literature related to supply chain sustainability and innovation, this paper aims at analyzing whether a higher level of innovativeness of the company implies a stronger approach of supply chain sustainability. This survey-based study focuses on the fashion industry, being an ideal setting for studying sustainability challenges.

025-0656 Innovation, sustainability and strategic management in a Brazilian small and medium enterprises

Marcelo Freitas, Student, Universidade De Sao Paulo, Brazil
 Ana Gati, Student, Universidade De Sao Paulo, Brazil
 Guilherme Ary Plonski, Emeritus Professor, Universidade De Sao Paulo, Brazil
 Saraiva Caio, Student, Universidade De Sao Paulo, Brazil
 Henrique Galvão, Student, Universidade De Sao Paulo, British Indian Ocean Territory
 Clovis Galdino, Student, Universidade Metodista De Sao Paulo, Brazil

This study, it glimpses to evaluate indicators related both organizational innovation and learning performances based on sustainable practices. Those conducts to have qualified information's gathered from the competitive environment and treated appropriately can get solutions with embedded technologies into the product in a creative way, can enlarge profitable market share.

66	Friday, 01:30 PM - 03:00 PM, Northwestern (Floor 6) <i>Session:</i> Variety Management in Retail Operations <i>Chair(s):</i> Muge Yayla-Kullu Almula Camdereli	<i>Track:</i> Product Management
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025-0579 Implications of Economic Uncertainty on Product Line Design and Capacity Investments
 Muge Yayla-Kullu, Assistant Professor, Rensselaer Polytechnic Institute, United States
 Jayashankar Swaminathan, Professor, University Of North Carolina Chapel Hill, United States

We analytically study the effects of market uncertainty about customer willingness to pay on the product line decisions of a firm with limited resources. We find that considering resource availability and economic uncertainty early on would help firms survive through hard times.

025-0852 Production and Sales Planning in Capacitated New Product Introductions
 Ozlem Bilginer, Researcher, amazon, United States
 Feryal Erhun, Assistant Professor, Stanford University, United States

How should a firm introduce a new product when its capacity is restricted? Should it delay introduction to build inventory? Should it introduce the product as soon as possible? How does the intensity of competition and product and market characteristics affect these decisions? We investigate such questions.

025-1067 On Minimizing the Expected Cost of Fraudulent Proclivity: The Impact of Returns Horizon
 Muge Yayla-Kullu, Assistant Professor, Rensselaer Polytechnic Institute, United States
 M. Ali Ulku, Assistant Professor, Capital University, United States
 Lynn C. Dailey, Associate Professor, Capital University, United States

Fraudulent returns are costly. In a consumer-retailer setting, we develop a stochastic optimization model to aid retailers in understanding the impact of not only price and refund rate but also the returns horizon on fraudulent returns. We offer analytical solutions for and managerial insights into optimal product return policies.

025-0146 Do "Design Responsive" Retail Firms Have Better Financial Performance and Higher Customer Satisfaction?
 Lawrence Plummer, Assistant Professor, University Of Oklahoma, United States
 Aleda Roth, Professor, Clemson University, United States
 Lawrence Fredendall, Professor, Clemson University, United States
 Jeff Shockley, Assistant Professor, Radford University, United States

An empirical model measures the strategic design responsiveness of retail chain store systems over time. More design responsive retail firms are found to have better financial operating performance year-to-year, and better forward-year customer satisfaction scores than non-responsive retail firms. Furthermore, design responsiveness helps to create a more sustainable store network.

67	Friday, 01:30 PM - 03:00 PM, Ballroom C (Floor 5) <i>Session:</i> Increasing Safety and Efficiency in Vanderbilt's Operating Rooms <i>Chair(s):</i> Brian Rothman	<i>Track:</i> Healthcare Operations
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025-1451 Surgeon Driven Early (7 Day) Release of Block to Improve Utilization/Throughput
 William Nealon, Professor of Surgery and Vice Chairman, Dept of Surgery, Vanderbilt University, United States

As the 7 Day Release Program was implemented in a staged fashion actual utilization of released time most commonly went to same service. Average case per day grew from 105 to 130. By simple estimate \$5,000.00/case-one new case/day-250 days/year=added revenue \$1.25 million/year. Actual revenues gained have been considerably higher.

025-1460 Reliable and efficient "off-site" surgical support through multiple system integration
 Brian Dakin, Administrative Director, Vanderbilt University, United States

Off-site surgical support functions, including case cart preparation and surgical instrument processing, can be achieved through multiple system integration, Lean process methodology and coordination. Communication, coordinated process modification and shared responsibility drove Vanderbilt's change to support infrastructure and surgical volume growth within the perioperative area.

025-1721 Partnership, Leadership and Continuous Collaboration in the Perioperative Setting for Safety and Efficiency
 Nancye Feistritz, Associate Hospital Director, Vanderbilt University Hospital, United States

Partnership and continuous collaboration between hospital administrators, nurses and surgeons is essential in creating a perioperative safety culture. Adverse events can result when increased throughput is achieved by overlooking/bypassing policies and procedures. Vanderbilt's governance structure translates institutional level quality goals into an operational safety culture while sustaining improved performance.

025-0538 Perioperative Efficiency Through Consistent Case Board Signaling
 Brian Rothman, Medical Director, Department of Anesthesiology, Medical Director, Perioperative Informatics, Medi, Vanderbilt University, United States
 Nimesh Patel, Director, Perioperative Informatics and Computing, Vanderbilt University, United States
 Diane Johnson, Director Access/ Throughput Perioperative Services, Vanderbilt University, United States
 David Wyatt, Administrative Director Perioperative Services, Vanderbilt University, United States

Consistent signaling through integrated, transparent operating room case boards should increase efficiency and safety in the perioperative environment. Identification, implementation and education for system modifications aligned new care milestone definitions. First case on time starts increased from 48% to a sustained 70% with a perception of improved patient safety.

68	Friday, 01:30 PM - 03:00 PM, Kansas City (Floor 5) <i>Session:</i> Healthcare Operations Management <i>Chair(s):</i> Jonathan Helm	<i>Track:</i> Healthcare Operations
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025-1705 Using GIS and Simulation for Analyzing Optimal Organ Allocation for Liver and Kidney Transplant

Naoru Koizumi, Professor, George Mason University, United States
 Nigel Waters, Professor, George Mason University, United States
 Amit Patel, Student, George Mason University, United States
 Debasree DasGupta, Student, George Mason University, United States

Geographic disparity in access to organ transplant has long been discussed among transplant researchers. Our study develops an analytical framework for investigating (i) geographic disparity in access to liver and kidney transplant using GIS-based spatial analysis and (ii) organ-sharing boundaries as a contributing factor to geographic disparity in access.

025-0597 Development of a multi-level in-patient care simulation with blocking

K. Louis Luangkesorn, Assistant Professor, University of Pittsburgh, United States
 Theologos Bountourelis, Assistant Professor, University of Pittsburgh, United States
 Spencer Nabors, Assistant Professor, Department of Veterans Affairs Medical Center, United States
 Gilles Clermont, Associate Professor, Department of Veterans Affairs Medical Center, United States
 Andrew Schaefer, Professor, University Of Pittsburg, United States

Intensive care units are expensive resources. Adding to cost of care is blocking of movement of patients ready to transfer. We develop a model using clinically required stay and determine that the resulting patient stay matches historical data. We use the model for modeling new operating concepts and capacity decisions.

025-1409 Drivers of Quality and Efficiency: A Healthcare Perspective

Scott Lindsey, Assistant Professor, Dixie State College of Utah, United States
 Sriram Thirumalai, Assistant Professor, University Of Utah, United States
 Jeff Stratman, Associate Professor, University Of Utah, United States

Data from 152 California hospitals is used to empirically examine the effect of process standardization, service emphasis and operational focus on outcome quality and technical efficiency. Contrary to prior work, operational focus is found to be negatively associated with outcome quality and efficiency. Quality and efficiency exhibit a trade-off relationship.

025-0894 Operational Planning Models with Service Pathways: Project Portfolio for Phase 1 Trials

Mark Van Oyen, Associate Professor, University Of Michigan Ann Arbor, United States
 Blake Roessler, Professor, Michigan Clinical Research Unit, United States
 Jivan Deglise-Hawkinson, Student, University Of Michigan Ann Arbor, United States

How should a portfolio of clinical trial studies be selected for a performance site? Our optimization methodology provides decision support by analyzing tradeoffs between (1) the financial value associated with the portfolio, (2) the impact of congestion on waiting times to start treatment (3) staff overtime and (4) resource under-utilization.

69	Friday, 01:30 PM - 03:00 PM, Wisconsin (WI) (Floor 6) <i>Session:</i> Service Quality in Healthcare <i>Chair(s):</i> Andrea Micchelucci Malanga	<i>Track:</i> Healthcare Operations
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025-0691 Evaluation of the quality perception in Brazilian public hospital

Vidigal Martins, Associate Professor, Universidade Federal de Uberlandia, Brazil
 Chen Yen-Tsang, Student, Fundacao Getulio Vargas, Brazil
 Peterson Gandolfi, Professor, Universidade Federal de Uberlandia, Brazil
 Renata Paulo, Professor, Universidade Federal de Uberlandia, Brazil

Existing studies have pointed that TQM is not enough to assure the quality of a hospital and it is well known that driver stakeholders such as doctor, receptionists and patients have different quality perception. This research identified differences at the hospital quality benchmarking system according to the patient perspective.

025-0921 Patient Satisfaction Management in Healthcare

Sanjeev Bordoloi, Associate Professor, University Of St. Thomas, United States

Patient satisfaction is often a top priority within healthcare organizations. However, organizations face with challenges in keeping the patient satisfaction scores up. We studied a hospital that is facing challenges related to their phone services. The goal is to improve the overall service ultimately leading to improvement in patient satisfaction.

025-0646 Quality Dimension Evaluation in a Public Primary Healthcare Assistance Network in a South Region of Sao Paulo

Andrea Micchelucci Malanga, Professor, Sumare University, Brazil
 Suzana Souza Santos, Professor, Universidade Mackenzie, Brazil

This research involves the evaluation of a public primary healthcare assistance services by the perception of patients. The study provides knowledge of quality services in the Primary Healthcare Assistance and also contributes to indicators mentioning which issues related to quality dimensions directly impact the patient satisfaction.

71	Friday, 01:30 PM - 03:00 PM, Cook (Floor 3) <i>Session:</i> Fresh Insights on Supply Chain Risk Through Different Methodological Approaches <i>Chair(s):</i> Stephan Wagner	<i>Track:</i> Supply Chain Risk
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025-0455 Governance Mechanisms as Gestalts in Managing Supplier Opportunism/Risk in Strategic Outsourcing Engagements

Ravi Srinivasan, Instructor, Michigan State University, United States
 Ram Narasimhan, Professor, Michigan State University, United States

Using gestalts as an approach to theory building, this study examines if there are specific patterns of governance mechanisms that are utilized by managers in outsourcing engagements. . The results indicate that transactional and relational governance mechanisms act as complements to each other when supplier opportunism is high.

025-0468 Supply Chain Risk: Prepare or Respond? Diversify or Fortify?

Daniel Whitney, Retired, Massachusetts Institute Of Technology, United States
 Daniel Heller, Associate Professor, Yokohama National University, Japan
 Jianxi Luo, Assistant Professor, New York University, United States

Based on the cases Aisin Seiki fire and Riken earthquake (and several other German and US examples), the paper describes several disaster recoveries and suggests that sole source advantages may outweigh disaster risk if recovery is energetic enough, and that characteristics of the affected product limit the recovery alternatives.

025-0940 Random Capacity Risk in Decentralized Supply Chains with Competing Suppliers

Uday Rao, Associate Professor, University Of Cincinnati, United States
 Bollapragada Ramesh, Associate Professor, San Francisco State University, United States
 Hareesh Gurnani, Professor, University Of Miami, United States
 Fei Qin, Student, University Of Cincinnati, United States

For a two echelon supply chain with upstream suppliers feeding a downstream buyer, this paper explicitly considers agents' incentives and actions by investigating optimal ordering and pricing policies. Our research illustrates how random supply capacity would affect supply chain performance and key agents' incentives for reducing capacity uncertainty.

025-1689 Responding to Supply Chain Disruption: Different Methodological Approaches

ManMohan Sodhi, Professor, Cass Business School, United Kingdom
 Christopher Tang, Professor, University Of California Los Angeles, United States

For unforeseen risk incidents with potentially disastrous impact, response may be the only way to contain the damage. To study response, we describe different methodological approaches that include modeling and empirical work. We also describe a grounded theory approach to studying the response at a pharmaceutical company.

72	Friday, 01:30 PM - 03:00 PM, Ballroom G (Floor 5)	<i>Track:</i> Service Operations
	<i>Session:</i> IT and Professional Services	
	<i>Chair(s):</i> M Reza Abdi	

025-0162 Total Quality Management for Improving Services of IT Based Organizations: A Case Study

M Reza Abdi, Assistant Professor, Bradford University, United Kingdom

This paper applies TQM theories to facilitate improving IT products/services. A TQM-business framework is proposed based on business performance factors in IT organizations. The framework key elements are transformed to a proposed AHP model for further evaluation through a case study while using the expected values of the collected data.

025-0675 Can ERP and informality achieve a trade-off between efficiency and flexibility? A simulation study on service

Yucan Wang, Student, Aston University Birmingham, United Kingdom
 Greasely Andrew, Lecturer, Aston University Birmingham, United Kingdom

The paper presents a simulation study to examine tenancy service performance in a shopping centre. Our findings suggest a service company with informal activities to a certain degree could achieve a trade-off between efficiency and flexibility, because it overcomes inflexibility of fixed design system with continuous updating by frontline practices.

025-1215 Knowledge Diffusion In Service Supply Networks

Ram Ganeshan, Professor, College Of William & Mary, United States
 Tonya Boone, Associate Professor, College Of William & Mary, United States

This paper applies social contagion theory to knowledge diffusion in a professional service supply network. Using data from a professional service supply network, we examine 1) whether knowledge acquisition and diffusion is explained by social cohesion, and 2) whether supply chain partner connectedness affects project performance.

025-1419 The impact of Information Technology (IT) on the perception of quality of higher education service

Daniel Galelli, Student, Fundacao Getulio Vargas, Brazil
 João Mario Csillag, Professor, Fundacao Getulio Vargas, Brazil
 Ronaldo Dultra-de-Lima, Student, Fundacao Getulio Vargas, Brazil
 Chen Yen-Tsang, Student, Fundacao Getulio Vargas, Brazil
 João Luis Quaglia, Student, Fundacao Getulio Vargas, Brazil

The purpose of this study is to analyze the impact of Information Technology (IT) on the quality perception of graduation-level education in business administration. This study concludes that business administration students prefer a conventional way of teaching and learning, despite the advances of IT in the corporate and educational environment.

73	Friday, 01:30 PM - 03:00 PM, Miami (Floor 5)	<i>Track:</i> Service Operations
	<i>Session:</i> New Service Development	
	<i>Chair(s):</i> Julie Paquette	

025-0815 Managing 'Lean': Lean Implementation within a UK Business School

Harry Barton, Professor, Nottingham Trent University, United Kingdom
 Baback Yazdani, Professor, Nottingham Trent University, United Kingdom

This paper investigates the implementation of a 'lean thinking' approach to managing a UK Business School and analyses its impact on internal operations. The overall lean operating system covers all the fundamental elements of a system encompassing: structure, management and leadership, processes, tools and technologies, and above all engages staff.

025-0521 Service Complexity and the Perils of Productization

Barry Cross, Lecturer, Queens University, Canada
Julie Paquette, Assistant Professor, Hec Montreal, Canada

Complexity in Services is an increasing phenomenon, and one that if left unchecked, can result in customer anxiety and employee uncertainty. Increasingly, this complexity is coming in the form of productization, or the proliferation of products offered by service organizations. The authors examine the connection between the organization's product portfolio and complexity in service provision.

025-0743 The antecedents and the impact of using Unsolicited Customer Input in New Service Development

Amitkumar Kakkad, Student, London Business School, United Kingdom

This paper examines the role of Unsolicited Customer Input as a driver of Service Innovation through exploratory case study of 8 firms and proposes a conceptual framework covering the process that the firms need to follow to leverage unsolicited customer input in NSD, and the factors that impact the process.

025-0819 A Model for Optimizing the E-service Process Based on Quality Function Deployment

Zhenyu Liu, Professor, Xiamen University, China

Based on QFD, a metric consisting of costs, time, reliability, Usability, and empathy is designed for optimizing service process. A model for optimizing service process is built under considering constrains of the resource and time invested by the E-service providers to optimize the service process.

025-1809 A Concept for Order Change Management in ETO Supply Chains

Emrah Arica, Student, Norwegian University Of Science And Technology, Norway
Erland Alfnes, Associate Professor, Norwegian University Of Science And Technology, Norway

This study primarily focuses on the material management issues implied by the engineering changes. It aims for developing a conceptual framework aiding these challenges, in sync with the management of entire project in order to deliver the product efficiently in time and cost wise.

74	Friday, 01:30 PM - 03:00 PM, Minnesota (MN) (Floor 6)	<i>Track:</i> OM and Economic Models
	<i>Session:</i> Operations Economics	
	<i>Chair(s):</i> Fuqiang Zhang Cuihong Li	

025-0503 Honesty as an optimal policy under bounded rationality

He Chen, Student, University Of Maryland, United States
Krishnan Anand, Associate Professor, University Of Utah, United States
Manu Goyal, Assistant Professor, University Of Utah, United States

Incomplete contracts are vulnerable to opportunism. In a multi-period relationship with incomplete contracts between a boundedly-rational manufacturer and his supplier, we prove that an 'honest' manufacturer can outperform a quintessential 'opportunistic' manufacturer, even though the opportunistic manufacturer can mimic the honest manufacturer. Thus, honesty emerges endogenously as an optimal policy.

025-0744 The role of information in outsourcing competition

Xiaole Wu, Assistant Professor, Fudan University, China
Fuqiang Zhang, Associate Professor, Washington University St Louis, United States

We study an outsourcing game where two firms choose between the efficient and responsive outsourcing strategies. We show how the information structure and other problem parameters affect the equilibrium of the outsourcing game.

025-0136 Advance demand information, price discrimination, and pre-order strategies

Fuqiang Zhang, Associate Professor, Washington University St Louis, United States
Cuihong Li, Assistant Professor, University Of Connecticut Storrs, United States

Pre-order allows a seller to obtain advance demand information for inventory planning, and to implement price discrimination. We analyze the value of advance demand information and the impact of price guarantees in pre-order strategies in the presence of consumers' strategic waiting behavior.

025-0823 Strategic Waiting for Quality Information: Bayesian Inference from Past Consumer Experiences

Laurens Debo, Associate Professor, University Of Chicago, United States
Man Yu, Assistant Professor, Hong Kong University Of Science & Tech, China
Roman Kapuscinski, Professor, University Of Michigan Ann Arbor, United States

For many goods whose quality is unknown, e.g. movies, less picky consumers delay purchasing until they have learned from more picky consumers about their experience with the product. We develop a formal Bayesian model that analysis this effect.

76	Friday, 03:30 PM - 05:00 PM, Scottsdale (Floor 5)	<i>Track:</i> Behavioral Operations
	<i>Session:</i> Behavior in OM	
	<i>Chair(s):</i> Mirko Kremer	

025-1487 Follow-the-crowd Queue Joining Behavior: An Experimental Investigation

Mirko Kremer, Assistant Professor, Penn State University State College, United States
Laurens Debo, Associate Professor, University Of Chicago, United States

When there is doubt about the service quality, less informed consumers may be attracted by the long lines in front of a service facility, despite the longer waiting times. We study how the presence of more informed consumers leads to follow-the-crowd queue joining behavior of the less informed consumers.

025-1499 Behavioral Benefits and Pitfalls of Top-down and Bottom-up Forecasting Processes

Mirko Kremer, Assistant Professor, Penn State University State College, United States
Doug Thomas, Associate Professor, Penn State University University Park, United States
Enno Siemsen, Assistant Professor, University Of Minnesota, United States

Organizations need forecasts at multiple levels of aggregation to support operational decisions. We examine how characteristics of related time series, including their correlations, affect how human subjects improve, or fail to improve, the accuracy of forecasts at different levels of aggregation under both top-down and bottom-up forecasting approaches.

025-0974 Limiting Policies in New Product Development

Paulo Goncalves, Associate Professor, University Of Lugano, Switzerland
Jaime Castaneda, Student, University Of Lugano, Switzerland

Previous research on new product development efforts finds that sharing resources across multiple projects often leads to firefighting. Based on a case study of a start-up building computational fluid dynamics models, this study develops a model showing that shared resources across multiple projects and different functions can mitigate firefighting.

025-1666 The Effects of Retailer's Markdown Frequency in the Presence of Strategic Customers' Learning Behavior

Kathryn Stecke, Professor, University Of Texas Dallas, United States
Ilhan Ertan, Student, University Of Texas Dallas, United States

The learning behavior of consumers captures the transition of consumers from being myopic to becoming strategic based on the markdown frequency and the markdown level followed by the retailer. Instead of assuming a static strategic customer base in population, we study the effect of population dynamics over time.

77	Friday, 03:30 PM - 05:00 PM, Lincolnshire II (Floor 6)	<i>Track:</i> Empirical Research in OM
	<i>Session:</i> Empirical Research in Manufacturing & Service Operations	
	<i>Chair(s):</i> Antonio Moreno Santiago Gallino	

025-0150 Field Experiments in Retail Operations

Santiago Gallino, Student, University Of Pennsylvania, United States
Antonio Moreno-Garcia, Assistant Professor, Northwestern University, United States
Marshall Fisher, Professor, University Of Pennsylvania, United States

Field experiments avoid some of the shortcomings associated with observational data. We argue that there is also a lot of potential for using field experiments to study questions that are relevant to the operations management discipline. As an illustration, we describe some experiments we have performed in retail contexts.

025-0114 Structural Estimation of Callers' Delay Sensitivity in Call Centers

Baris Ata, Associate Professor, Northwestern University, United States
Che-Lin Su, Assistant Professor, University Of Chicago, United States
Zeynep Aksin, Professor, Koc University, Turkey
Seyedmorteza Emadi, Student, Northwestern University, United States

We propose a new model for callers' abandonment behavior. Using this model, we estimate the waiting cost and service utility of the callers, and predict the performance measures after changing the routing policy of a call center.

025-0016 Deriving Supply Chain Metrics from Financial Statements

Haim Mendelson, Professor, Stanford University, United States
Robert Bray, Student, Graduate School of Business, United States

We develop an empirical supply chain model from classic inventory theory. The model enables empiricists to derive operational metrics from "demand signal processing"---how demand information translates through supply chains---and perform corresponding counterfactuals. We conduct six studies with our methodology and firm-level Compustat data.

025-1118 Who are My True Competitors? Let the Customer Decide

Serguei Netessine, Emeritus Professor, INSEAD, France
Jun Li, Student, University Of Pennsylvania, United States

This paper provides guidance for hotel revenue management from a competitive point-of-view. Using consumer click stream data, we adopt the social network approach to construct the competitor network from the consumer comparison sets in their searches for hotels. This consumer-centric network approach is further compared to traditional approaches.

78	Friday, 03:30 PM - 05:00 PM, Ohio State (Floor 6)	<i>Track:</i> Humanitarian Operations and Crisis Management
	<i>Session:</i> Global Health Delivery: Transitioning from Humanitarian Assistance to Long-Term Sustainability	
	<i>Chair(s):</i> Prashant Yadav	

025-1517 Innovative Models in Global Health Delivery: Two Examples

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

Long-Term sustainability is only possible when interventions are not only effective but efficiently delivered. In this talk I will discuss two examples of innovative delivery systems - tuberculosis treatment in India and indoor residual spraying for malaria prevention in Uganda. I will highlight some common themes that emerge.

025-1550 Understanding supply chain and retail stocking behavior in remote drug shops in rural Tanzania

Jessica Cohen, Assistant Professor, Harvard University, United States
 Prashant Yadav, Director of Healthcare Research, William Davidson Institute at University of Michigan, United States
 Jean Arkedis, Research Manager, Results for Development, United States
 Sarah Alphas, Research Associate, William Davidson Institute at University of Michigan, United States
 Peter Larson, Student, University Of Michigan Ann Arbor, United States

Through field experimentation and high frequency data collection on stocking and sourcing behavior we understand the drivers that impact stocking of essential medicines in remote drug shops in Tanzania.

025-1158 Multiproduct Humanitarian Healthcare Supply Chains: A Network Modeling and Computational Framework

Min Yu, Student, University Of Massachusetts Amherst, United States
 Anna Nagurney, Professor, University Of Massachusetts Amherst, United States
 Qiang Qiang, Assistant Professor, Penn State University Great Valley, United States

We develop a model for supply chain network design / redesign in the case of multiple products, with particular relevance to humanitarian healthcare. The model may be utilized for the determination of the optimal allocation of resources for multiple vaccine and medicine production, storage, and distribution to points of need.

79	Friday, 03:30 PM - 05:00 PM, Purdue (Floor 6)	<i>Track:</i> OM in China/East Asia
	<i>Session:</i> Game Analysis in Supply Chain Management	
	<i>Chair(s):</i> Mingming Leng	

025-0023 Promoting Electric Automobiles: Supply Chain Analysis under a Government's Subsidy Incentive Scheme

Mingming Leng, Associate Professor, Lingnan Univ, Hong Kong
 Liping Liang, Assistant Professor, Lingnan Univ, China
 Jian Huang, Associate Professor, Jiangxi University of Finance and Economics, China

We analyze an electric automobile supply chain and a traditional fuel automobile supply chain, under a government's incentive scheme that aims at promoting the electric automobile for the control of air pollution. We compute negotiated retail prices, derive two manufacturer's wholesale prices in Nash equilibrium, and investigate the social welfare.

025-0015 Game-Theoretic Analysis of a Two-Echelon Supply Chain with a Retailer as the Quality Gatekeeper

Mingming Leng, Associate Professor, Lingnan Univ, Hong Kong
 Zaichen Li, Student, Lingnan Univ, Hong Kong
 Liping Liang, Assistant Professor, Lingnan Univ, China
 Jian Huang, Associate Professor, Jiangxi University of Finance and Economics, China

We develop a leader-follower game and solve it to find Stackelberg equilibrium for a two-level supply chain involving a manufacturer and a retailer who serves as a quality gatekeeper. We examine the impact of the retailer's gatekeeping on the manufacturer's and the retailer's optimal decisions and maximum profits.

025-0130 The Comparison of Two Vertical Outsourcing Structures under Push and Pull Contracts

Pengfei Guo, , Hong Kong Polytechnic Univ, Hong Kong
 Yulan Wang, Assistant Professor, Hong Kong Polytechnic Univ, Hong Kong

In this paper, we compare the two outsourcing structures - control and delegation - under push and a pull contracts. For all combinations of outsourcing structures and contracts, we derive the corresponding equilibrium wholesale prices, order quantities and capacities. We also extend our settings to a general two-wholesale-price contract.

025-0632 Optimal capacity decision considering supplier's risk attitude under asymmetric forecast information

Huaming Song, Associate Professor, Nanjing University of Science and Technology, China

We study a stackelberg game between a risk sensitive supplier and a risk neutral retailer who owns private demand forecast information. In order to enable credibly forecast information sharing, two kinds of supply contracts are proposed and the equilibrium conditions are derived. Further, the issue of channel coordination is discussed.

80	Friday, 03:30 PM - 05:00 PM, Great America II (Floor 6)	<i>Track:</i> OM Practice
	<i>Session:</i> Enterprise Level Perspective in Operations	
	<i>Chair(s):</i> Richard Franza	

025-1526 Enterprise Planning and the Myth of Collaboration in Supply Chains

Suri Gurumurthi, Assistant Professor, University of Illinois, Urbana-Champaign, United States

I present a critical analysis of the effort to fit present day enterprise resource planning (ERP) and similar frameworks that were adopted successfully within more centralized and vertically integrated regimes, to an increasingly leveraged and decentralized supply chain model. I focus on product development, program management, and logistics examples.

025-1329 The Logistic Maturity Model: guidelines for logistic processes continuous improvement

Claudia Battista, Reader, University Of Rome - Tor Vergata, Italy
 Andrea Fumi, Student, University Of Rome - Tor Vergata, Italy
 Massimiliano Schiraldi, Assistant Professor, University Of Rome - Tor Vergata, Italy

This paper presents a Logistic Maturity Model. The goal is to provide companies with a system that allows both to assess their logistic processes current status and to outline an action plan for improvements, considering four key elements: Modeling Framework, Maturity Framework, Performance Framework and Improvement System.

025-0643 Strategic Management impacts caused by Balanced Scorecard and the Enterprise Resource Planning

Celso Couto, Lecturer, Universidade Paulista - Unip, Brazil
 Ademir Ferreira, Emeritus Professor, Universidade Paulista - Unip, British Indian Ocean Territory
 Andrea Michelucci Malanga, Professor, Sumare University, Brazil

This study had as main objective to verify, analyze and describe the difficulties and synergies between the strategic management methodology BSC (Balanced Scorecard) and integrated information system ERP (Enterprise Resource Planning) in companies that already some used years use tools for the strategic management of their businesses.

025-0006 Improvement Priority: Benefit & Effort (B&E) Analysis

Richard Franza, Associate Professor, Kennesaw State University, United States
 Satya Chakravorty, Professor, Kennesaw State University, United States

Recent research indicates that many improvement programs fail to yield desired results in companies. One reason these programs fail is because the improvement projects are not correctly prioritized. This study shows how to design and implement Benefit & Effort (B&E) analysis to prioritize improvement projects in manufacturing operations.

81	Friday, 03:30 PM - 05:00 PM, Dupage (Floor 3) <i>Session:</i> Planning and Scheduling for Transportation <i>Chair(s):</i> Zhou Xu	<i>Track:</i> Scheduling and Logistics
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025-0107 An Effective Approach for Vehicle Routing Problem with Three-Dimensional Loading Constraints

Fan Wang, Professor, Sun Yat-Sen University, China

We consider the Three-Dimensional Loading Capacitated Vehicle Routing Problem which combines the routing of a fleet of vehicles and the loading of three dimensional shaped goods into the vehicles. Compared with previous works, we propose a least waste packing heuristic based approach with better performance.

025-0451 Yard template planning in transshipment hubs under uncertainty

Lu Zhen, Associate Professor, Shanghai University, China

This paper studies how to make a robust yard template under uncertain environment. To reduce the potential traffic congestion of prime movers, the workload distribution of sub-blocks within the yard is considered. A mixed integer programming model is formulated. Moreover, a heuristic algorithm is developed for solving the problem in large-scale.

025-0094 An Improved Approximation Algorithm for the Generalized Multiple Depot Multiple TSP

Brian Rodrigues, Associate Professor, Singapore Management University, Singapore
 Zhou Xu, Assistant Professor, The Hong Kong Polytechnic University, China

Given k salesmen, we present a $[2-1/(2k)]$ -approximation algorithm for an extension of the traveling salesman problem (TSP), where one needs to decide a route and a depot for each salesman, so as to minimize the total travel distance for the k salesmen to service all customers in a metric graph.

025-1150 A Hybrid Genetic Algorithm for the Multiple Crossdocks Problem

Zhaowei Miao, Professor, Xiamen University, China
 Ke Fu, Associate Professor, Sun Yat-Sen University, China

We propose a Hybrid Genetic Algorithm integrating greedy technique and variable neighborhood search method to solve a multiple crossdocks problem with supplier and customer time windows, where the flows through the crossdock are constrained by fixed transportation schedules and crossdock capacity.

82	Friday, 03:30 PM - 05:00 PM, Ballroom A (Floor 5) <i>Session:</i> Carbon footprints <i>Chair(s):</i> Tarkan Tan	<i>Track:</i> Sustainable Operations
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025-0434 Carbon-Optimal and Carbon-Neutral Supply Chains

Felipe Caro, Assistant Professor, University Of California Los Angeles, United States
 Rob Zuidwijk, Professor, Erasmus University Rotterdam, Netherlands
 Tarkan Tan, Assistant Professor, Eindhoven University of Technology, Netherlands
 Charles Corbett, Professor, University Of California Los Angeles, United States

In this paper we explore the differences between making a supply chain carbon-neutral by offsetting all emissions vs. making it carbon-optimal by inducing all parties to invest appropriately in reducing GHG emissions. We examine conditions under which first-best can and cannot be achieved, and examine various decentralized outcomes.

025-0460 The production capacity investment decision under asymmetric carbon emission regulation

Tarkan Tan, Assistant Professor, Eindhoven University of Technology, Netherlands
 Kristel Hoen, Student, Eindhoven University of Technology, Netherlands
 Beril Toktay, Professor, Georgia Institute Of Technology, United States

Carbon emission regulation has divided the world into two groups of countries: those with emission regulation, and those without. This may provide incentives to produce in unregulated countries and import products. We study how this asymmetric regulation affects a company's production location decision and the impact of anti-leakage policy measures.

025-1464 Measuring the Carbon Footprint of Transportation: Uncertainty Analysis

Edgar Blanco, Professor, Massachusetts Institute Of Technology, United States

Anthony Craig, Student, Massachusetts Institute Of Technology, United States
 Xu Yang, Instructor, Massachusetts Institute Of Technology, United States
 Yin Lee, Student, Massachusetts Institute Of Technology, United States

A number of methods exist for measuring the carbon footprint of freight transportation, ranging from comprehensive programs such as the GHG Protocol to focused programs like the Clean Cargo Working Group. We present an uncertainty assessment methodology to compare and analyze different carbon footprint measurement strategies.

83	Friday, 03:30 PM - 05:00 PM, Denver (Floor 5) <i>Session:</i> Green supply chains <i>Chair(s):</i> Olga Willner	<i>Track:</i> Sustainable Operations
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025-0060 Sustainability Integration into the Core Supply Chain & Operations Class: Framework & Case Development
 Madeleine Pullman, Associate Professor, Portland State University, United States

The core operations and supply chain class offers many opportunities to incorporate sustainability with traditional and new topics. This session will provide suggestions and case materials for this integration. The goal is to create a relatively simple and seamless way to address sustainability within an existing class structure.

025-0296 Impact of collaboration on successful green supply chain implementation: An Inverted U relationship
 Taewon Hwang, Assistant Professor, Valdosta State University, United States
 Donghyun Choi, Student, University Of Nebraska Lincoln, United States

This study examines the relationships between green supply chain management (GSCM) practices, environmental collaboration, and firm performance. Environmental collaboration can help firms implement GSCM strategies more effectively, improving performance. However, the blind application of collaboration might cause diminishing returns. This study also focuses on this dark side of close relationships.

025-0512 Identification of Stimuli, Enablers and Inhibitors of GSCM and an Analysis of their Dynamics
 Dileep More, Assistant Professor, Indian Institute Of Management Calcutta, India
 Simanti Mitra, Student, National Institute of Technology, Durgapur, WB, India

The purpose of this paper is to list down the various stimuli, enablers and inhibitors of green supply chain management (GSCM) and present dynamics among these forces. This paper also addresses a conceptual framework to enable the organizations in proper implementation of GSCM by understanding the relation between the forces.

025-0582 Sustainability on global manufacturing networks: a co-evolutionary perspective
 Cristiane Villar, Student, Fundacao Getulio Vargas, Brazil
 Ely Paiva, Associate Professor, Fundacao Getulio Vargas, Brazil

Building on Co-evolutionary Theory and Operations Management literature, this paper aims to explore how sustainability practices are disseminated within global manufacturing networks. Specifically, it seeks to understand how these practices co-evolve within HQ-subsidiaries-institutional environment. The study explores nature, speed and quality of sustainability practices and proposes an analytical framework.

025-0848 Conceptual Architecture for Resource and Emission-Efficiency in Production Systems
 Olga Willner, Student, Swiss Federal Institute Of Technology Zurich, Switzerland
 Katharina Bunse, Lecturer, Swiss Federal Institute Of Technology Zurich, Switzerland

This paper presents a conceptual architecture for a software platform that supports eco-efficient manufacturing system configuration and simulation of production system behaviors. This platform integrates real-time data from shop-floor operations and the life-cycle perspective of machines. The architecture provides an integrated view and functional system requirements of submodules and interfaces.

84	Friday, 03:30 PM - 05:00 PM, Ballroom H (Floor 5) <i>Session:</i> Supply Risk in Sourcing Contracts <i>Chair(s):</i> Ruoxuan Wang	<i>Track:</i> Vendor and Supply Contracts
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025-0235 Supplier Rationalization: A Sourcing Decision Model
 Hugo DeCampos, Student, Michigan State University, United States
 Tomas Hult, Professor, Michigan State University, United States
 Srinivas Talluri, Professor, Michigan State University, United States

We draw on extant literature on strategic sourcing and supplier base rationalization to anchor our argument that measuring supplier performance diversity is germane to executing an effective supplier base rationalization strategy. We explicate how a novel approach to efficiency assessment can be utilized to measure performance diversity.

025-1038 (Co)3: Contracts, cost-effectiveness, and consumer surplus: a single period analysis
 Mustafa Cagri Gurbuz, Professor, Zaragoza Logistics Center, Spain
 Gerardo Pelayo, Student, Zaragoza Logistics Center, Spain

Motivated by the interest towards risk sharing contracts in healthcare, we analytically model of a three-echelon health care delivery chain considering two sources of uncertainty (demand size and patient heterogeneity) to analyze the effect of contract- and HC system decision making- design on the trade-off between access and service levels.

025-1368 Outsourcing for Power Disruption
 Janice Carrillo, Associate Professor, University Of Florida, United States
 Ruoxuan Wang, Student, University Of Florida, United States

In the event of a large scale power disruption, many manufacturers are now outsourcing to a third party supplier. We model different types of contracts between a manufacturer and a supplier in the event of a disruption utilizing options contracts and game theory methodologies.

85	Friday, 03:30 PM - 05:00 PM, Illinois (IL) (Floor 6)	<i>Track:</i> Manufacturing Operations
	<i>Session:</i> Theory of Constraints, Six-Sigma and Process Improvements	
	<i>Chair(s):</i> Milton Vieira Junior	

025-0215 The theory of constraints as a manufacturing strategy: a case study in a small manufacturing company

Washington Luiz Soares, Student, Unisanta, Brazil
 Hamilton Pozo, Student, Faccamp - Faculdade Campo Limpo Paulista, Brazil
 Takeshy Tachizawa, Associate Professor, Faccamp - Faculdade Campo Limpo Paulista, Brazil

The aim of this article is to use with success the Theory of Constraints as a strategy in a small manufacturing company. The contribution of this research is to provide elements and conditions for small manufacturing companies to use the TOC as a tool to reduce cost and improve productivity.

025-1339 Six Sigma as a Tool to Increase Ecoefficiency in Machining Processes: A Case Study

Wagner Lucato, Professor, Universidade Nove De Julho, Brazil
 José da Silva Santos, Student, Universidade Nove De Julho, Brazil
 Milton Vieira Junior, Professor, Universidade Nove De Julho, Brazil

This paper proposes a procedure where the Six Sigma approach is employed to improve the eco-efficiency in machining processes. This is done through a case study where the DMAIC method was applied to a turning operation aiming to identify, quantify and improve process eco-efficiency measures.

025-0624 Improvement of Cycle Time: Case of an Automobile Manufacturer

Rajeev Tripathi, Student, Op Jindal Global University, India
 Saroj Koul, Professor, Op Jindal Global University, India

The pilot research at a major manufacturer of automobile components is to investigate Cycle time, Lead time and Takt time and suggest methodologies and practices that help obtain lean manufacturing. This research helps manufacturing industries to reduce waste, lower inventory, optimize time and maximizing the layout space.

025-0517 Questioning Corporative Indicators: A deep analysis from the Theory of Constraints point of view

Luis Rodrigues, Professor, Universidade do Vale do Rio dos Sinos, Brazil
 Daniel Lacerda, Professor, UNISINOS, Brazil
 Bruna Lazzarotto, Student, Universidade do Vale do Rio dos Sinos, Brazil
 Caroline Costa, Student, Universidade do Vale do Rio dos Sinos, Brazil

Indicator systems are a base for organizational management and decision making process. Local measurements can mislead decisions and create difficulties to company strategic alignment. This paper proposes a pragmatic approach, inspired by TOC, to analyze operational indicators. The article also presents the results from this analysis in a Brazilian company.

86	Friday, 03:30 PM - 05:00 PM, Ballroom B (Floor 5)	<i>Track:</i> Supply Chain Management
	<i>Session:</i> Sustainable Supply Chains	
	<i>Chair(s):</i> Gal Raz	

025-0050 Design for the Environment: Life Cycle Approach Using a Newsvendor Model

Gal Raz, Associate Professor, University Of Virginia, United States
 Cheryl Druehl, Assistant Professor, George Mason University, United States
 Vered Blass, Lecturer, Tel Aviv University, Israel

Introducing environmental innovations in product and process design can affect the product's cost and demand, as well as the environmental performance in different stages of its life cycle. In this paper, we consider a profit maximizing firm (Newsvendor) deciding on the production quantity and the environmentally-focused design efforts.

025-0446 A Cost-Benefit Comparison of Product Take-Back Compliance Schemes

Eda Kemahlioglu-Ziya, Assistant Professor, University Of North Carolina Chapel Hill, United States
 Gokce Esenduran, Assistant Professor, Ohio State University, United States

Under product take-back legislation manufacturers finance the collection and treatment of their end of life products. The most common compliance schemes are by individual manufacturer, and collectively with cost allocation by market share. We compare these two schemes, based on cost to the manufacturer and on environmental benefits.

025-0874 Managing Inventory under Variable Funding Availability

Karthik V. Natarajan, Student, University Of North Carolina Chapel Hill, United States
 Jayashankar Swaminathan, Professor, University Of North Carolina Chapel Hill, United States

Motivated by the ready-to-use therapeutic food (RUTF) supply chain in Africa, we study the problem of managing inventory of a nutritional product under variable budget constraints. We present results related to the structure of the optimal policy and computationally analyze the impact of alternative funding patterns on the operating costs.

87	Friday, 03:30 PM - 05:00 PM, Houston (Floor 5)	<i>Track:</i> Teaching in OM
	<i>Session:</i> Teaching Operations Management to MBA Students	
	<i>Chair(s):</i> Wendell Gilland Joel Goldhar	

025-1061 Organization Theory Tools for Operations Management

Joel Goldhar, Professor, Stuart School of Business Administration, United States
 Arjun Chakravarti, Assistant Professor, Stuart School of Business Administration, United States

As OM moves toward a greater emphasis on service systems design and management; we need to modify our courses to create a better balance between 'people' issues and optimization. This Presentation will offer a set of Organization Behavior tools and concepts that extend/fit the traditional MBA OM Course Syllabus.

025-1523 Commit to Quality: The Importance of Malcolm Baldrige Criteria in Higher Education

Helene Caudill, Associate Professor, St. Edward'S University, United States

Quality in higher education does matter and stakeholders are demanding proof that universities and the degrees they bestow are based on sound criteria, such as those outlined in the Malcolm Baldrige Quality Award. St. Edward's University recently received a "commit to quality" award based on the seven Baldrige criteria.

88	Friday, 03:30 PM - 05:00 PM, Watertower (Floor 10) <i>Session:</i> Scripting and Improvisation in Service Delivery <i>Chair(s):</i> Liana Victorino	<i>Track:</i> OM in Travel, Tourism, and Hospitality Industries
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025-1136 Service Scripting: An Exploratory Analysis of Customer Perceptions

Liana Victorino, Assistant Professor, University Of Victoria, Canada
 Alexander Bolinger, Assistant Professor, Idaho State University, United States

Hospitality firms often use scripts to facilitate service delivery. This study will explore how customers perceive such scripted service using convergent evidence from qualitative and quantitative data. Research and managerial implications will be presented including a discussion of potential strategies for effectively leveraging service scripts in a hospitality setting.

025-0879 Operational integration of a service script

Marie-Pierre Spooner, Associate Professor, Université du Québec à Montréal, Canada

The ability to integrate a service script in the operational system of an organisation is a challenge. New services are often developed with an eye to marketing but with a limited understanding of the operational capabilities. A longitudinal case study of the integration of a service script will be presented.

025-1130 Towards a Theory of Service Improvisation Competence: Evidence from the Hospitality Industry

Aleda Roth, Professor, Clemson University, United States
 Rohit Verma, Professor, Cornell University, United States
 Enrico Secchi, Student, Clemson University, United States

In this paper, we develop a model of the design choices that lead to the development of a Service Improvisation Competence-i.e. the ability to creatively adapt to customer-induced uncertainty-and its outcomes. We empirically test the model using multiple primary and secondary data sources from the Hospitality industry.

025-1674 Configurations of Hospitality Services based on Strategic Orientation and Corporate Culture

Spring Han, Lecturer, Center for Hospitality Research, United States
 Rohit Verma, Professor, Cornell University, United States

Using Cluster Analysis, we identify configurations of hospitality firms in South Korea based on their strategic orientation. Furthermore, we demonstrate that the corporate culture and financial performance of the firms in different clusters significantly differ from each other.

89	Friday, 03:30 PM - 05:00 PM, Ballroom F (Floor 5) <i>Session:</i> Profiting from Innovations <i>Chair(s):</i> Hojung Shin	<i>Track:</i> Product Innovation and Technology Management
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025-1470 Innovation Diffusion and Firm Growth

Moren Levesque, Professor, York University, Canada
 Jane Davies, Assistant Professor, University Of Cambridge, United Kingdom

We investigate whether growth in innovation adoption relates to firm investments in resources. Given the stage of innovation, we characterize which investments must grow to yield additional adopters. We offer and empirically test a counterpart to Bass innovation-diffusion model that also considers the supply of firm resources to meet demand.

025-1542 Commercializing Radical Innovation through Corporate Venturing: Exploring Effective Development Systems

Richard DeMartino, Associate Professor, Rochester Institute Of Technology, United States
 John Angelis, Assistant Professor, Rochester Institute Of Technology, United States

The existing literature does not distinguish between approaches when corporate venturing develops radical innovation instead of incremental. The purpose of this paper is to explore how corporations should optimally create new product development systems to manage non-linear development, deeper resource commitment, and long-term uncertainty and risk from radical innovation.

025-0763 Intellectual Property Licensing Strategy and Two-sided Market in Supply Chain

Tingting Jiang, Student, Northwestern University, United States

This paper studies the optimal licensing strategy of an Intellectual Property (IP) vendor that generates profit from licensing technology to both sides of a market: the sellers and the buyers. I show that the optimal licensing strategy depends on market expectation of the technology and subsidy strategy is often used.

025-1193 Effect of Hit Products on Firm Performance: Empirical Evidence from the Automobile Industry

Younsuk Lee, Student, Korea University, Korea, Republic of (South Korea)
 Hojung Shin, Associate Professor, Korea University, Korea, Republic of (South Korea)

Although firms have spent billions of dollars in R&D, the empirical evidence that the R&D amount positively influences firm performance is sporadic at best. We test two main hypotheses that firms' capability of converting R&D into new products and hit products would mediate the linkage between R&D and firm performance.

90	Friday, 03:30 PM - 05:00 PM, Los Angeles (Floor 5) <i>Session:</i> Coordination in Inventory Systems <i>Chair(s):</i> Jennifer Ryan	<i>Track:</i> Production Planning and Scheduling
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025-0059 Supplier Facilitated Transshipments in a Multi-Retailer Distribution System

Jennifer Ryan, Associate Professor, Rensselaer Polytechnic Institute, United States
 Rong Li, Assistant Professor, Singapore Management University, Singapore
 Zhi Zeng, Student, Rensselaer Polytechnic Institute, United States

We study the role of inventory transshipment for achieving supply chain coordination in a multi-retailer distribution system. We demonstrate that to achieve coordination in a system with non-cooperative retailers, including the supplier in the transshipment system is critical. We thus propose and examine supplier-facilitated transshipments through bi-directional adjustment contracts.

025-1486 Inventory Management of Spare Parts Subject to Deterioration

Rong Li, Assistant Professor, Singapore Management University, Singapore
 Jennifer Ryan, Associate Professor, Rensselaer Polytechnic Institute, United States

Lack of coordination between machinery fault diagnosis and the inventory management of spare parts can lead to increased inventory costs and disruptions in production activity. To address this gap, we develop a framework for incorporating real-time sensor data into inventory decisions for spare parts that are subject to deterioration.

025-1537 Inventory Collaborations and Coordination Among n-Independent Retailers With Asymmetric Demand Information

Xinghao Yan, Assistant Professor, University Of Western Ontario, Canada
 Hui Zhao, Assistant Professor, Purdue University, United States

We study a decentralized n-retailer inventory sharing system. We develop a coordination mechanism (nRCM) which is in the core for transshipment, induces the complete inventory sharing, and coordinates the system. In addition, it can be implemented and leads to a result very close to the first-best solution without demand information.

025-1066 Scheduling Products with Subassemblies and Changeover Cost

Feng Zhou, Student, Indiana University Bloomington, United States
 James Blocher, Associate Professor, Indiana University Bloomington, United States
 Hans S Heese, Associate Professor, Indiana University, United States
 Xinxin Hu, Assistant Professor, Indiana University, United States

We consider the problem of scheduling products with two subassemblies on a common resource, where changeovers imply fixed costs. The objective is to minimize the weighted sum of flow time and changeover cost. We provide properties of optimal solutions and characterize optimal schedules. Our results have interesting implications for practice.

91	Friday, 03:30 PM - 05:00 PM, Northwestern (Floor 6) <i>Session:</i> Product Design and Customer Preferences <i>Chair(s):</i> Saurabh Bansal	<i>Track:</i> Product Management
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025-0587 Learning from Dynamic Assortments: A Nonparametric Bayesian Model

Dorothee Honhon, Assistant Professor, Eindhoven University of Technology, Netherlands
 Canan Ulu, Assistant Professor, University Of Texas Austin, United States

We develop a nonparametric Bayesian learning model for a firm that can gather information about consumer tastes through sales of its product assortment. The firm can dynamically change its product assortment from period to period to gather better information about consumer tastes.

025-0683 Flexible Products for Dynamic Needs

Aydin Alptekinoglu, Assistant Professor, Southern Methodist University, United States
 Karthik Ramachandran, Assistant Professor, Southern Methodist University, United States

We address a product design dilemma in the face of dynamic consumer needs that change randomly over time. Is it better from a firm's perspective to offer multiple custom products (a set of dumbbells each with a specific weight) or one flexible product (a weight-adjustable dumbbell)?

025-0128 Managing Supply Risk During the Life-Cycle of Technology Products

Sandra Transchel, Assistant Professor, Kuhne Logistics University, United States
 Saurabh Bansal, Assistant Professor, Penn State University University Park, United States

We show that a high-tech firm selling a number of vertically differentiated products should not always perform a downward substitution when faced with product stockouts. Customer behavior, manufacturing technology, and profit margins determine the firm's strategy for downward substitution during various stages of the life-cycle of the products.

025-0851 Application of the model system Earned Value Management System - EMVS to evaluate Product Development Process

José Salles, Professor, Universidade Nove De Julho, Brazil
 Rosangela Vanalle, Professor, Universidade Nove De Julho, Brazil
 Iara Cutovoi, Student, Universidade Nove De Julho, Brazil

Evaluation of a PDP model in an auto parts company, leader in its segment. EMVS performance analysis methodology is applied and a check list is created to avoid waste in project management. The results show the positive aspects of the methodology, but its implementation and repercussions take a long time.

92	Friday, 03:30 PM - 05:00 PM, Ballroom C (Floor 5) <i>Session:</i> Getting Your Healthcare OM Research Published <i>Chair(s):</i> Craig Froehle	<i>Track:</i> Healthcare Operations
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025-0076 Getting Your Healthcare OM Research Published
 Craig Froehle, Associate Professor, University Of Cincinnati, United States
 Anita Tucker, Associate Professor, Harvard University, United States
 Michael Pinedo, Professor, New York University, United States
 John Fowler, Professor, Arizona State University Tempe, United States

In this moderated panel, editors of top journals will discuss the hot topics in HOM being published, underrepresented areas and opportunities, and guidelines for increasing the probability that your research will be accepted. Represented journals will include POMS, MSOM, JOM, IIE Transactions on Healthcare Systems Engineering, and HealthCare Management Science.

93 Friday, 03:30 PM - 05:00 PM, Kansas City (Floor 5) *Track:* Healthcare Operations
Session: Challenges and Strategic Decisions in Pharmaceutical Supply Chains
Chair(s): Hui Zhao

025-1162 Joint Optimization of Investment in Phase II and III New Drug Development
 Panos Kouvelis, Professor, Washington University St Louis, United States
 Zhili Tian, Assistant Professor, Towson University, United States

Phase 3 clinical study is more expensive than Phase 2 study since firms test the drug on larger sample of patients. We develop methodologies to optimize the investment in both phases and to determine the sample size for Phase 2 study. Our methodologies help firms avoid investment in inferior drugs.

025-0645 Dynamic capacity expansion for a new drug
 Susan Xu, Professor, Penn State University University Park, United States
 Hiroko Okajima, Student, Penn State University University Park, United States

We investigate a pharmaceutical manufacturer's jointly optimal in-house capacity and partial outsourcing strategy during the life-span of a new drug to minimize the expected capacity investment costs and capacity imbalance costs. We formulate the problem as a discrete-time, finite-period stochastic dynamic program and employ real options approach.

025-0275 Managing Quality Across National Boundaries: A Multi-Country Study
 Brett Massimino, Student, Ohio State University, United States
 John Gray, Assistant Professor, Ohio State University, United States

We first examine whether and when geographic and cultural distance between headquarters locations and plant locations relates to the quality performance of pharmaceutical manufacturing plants. Further, we study the effect of certain national culture dimensions of both the plant and the headquarter country on plant-level quality performance.

025-0595 Design and Management of the Pharmaceutical Distribution Supply Chains
 Srinagesh Gavirneni, Associate Professor, Cornell University, United States
 Charles Xiong, Supply chain consultant, Terra Technology, United States
 Adam Fein, Consultant, Pembroke Consulting, Inc., United States
 Hui Zhao, Assistant Professor, Purdue University, United States

We investigate two business models (Investment Buying and Fee-for-Service (FFS)) that have been used by distributors in the US pharmaceutical supply chains. Through data analysis and analytical models, we show how brand-drug manufacturers and distributors should make their supply chain decisions and how to best design the FFS contracts.

94 Friday, 03:30 PM - 05:00 PM, Wisconsin (WI) (Floor 6) *Track:* Retail Operations
Session: Retail Operations III
Chair(s): Dorothee Honhon

025-1456 Emergence of Category Captainship
 Mumin Kurtulus, Assistant Professor, Vanderbilt University, United States
 Sezer Ulku, Assistant Professor, Georgetown University, United States
 Alper Nakkas, Instructor, Vanderbilt University, United States

Category captainship is a category management practice where a retailer relies on a manufacturer for recommendations regarding strategic category management decisions. We investigate the conditions under which category captainship practices are more likely to emerge in a context where manufacturers with different capabilities compete for the captainship position.

025-1704 Experiments on Learning with Censored Information
 Dorothee Honhon, Assistant Professor, Eindhoven University of Technology, Netherlands
 Canan Ulu, Assistant Professor, University Of Texas Austin, United States
 Kyle Hyndman, Assistant Professor, Maastricht University, Netherlands

There are multiple information sources available that vary in precision and cost. We conduct experiments where subjects estimate the probability that an urn was chosen by gathering uncensored, censored or no information. By varying the cost of information, we study biases in subjects' evaluation of uncensored versus censored information.

025-1716 Optimal Product Range and Feature Choice: Competing with Complexity
 Ananth Iyer, Professor, Purdue University, United States
 Kyoungsun Lee, Student, Purdue University, United States

We study how to leverage product mix (variety and product feature level) strategies to compete with complexity associated with product variety. We incorporate the nested logit demand into the newsvendor framework and show what drives firms to adopt different market approaches when demand uncertainty increases in variety.

025-1718 Assortment Planning for Configurable Products

Ali Taghavi, Student, Wayne State University, United States
 Ratna Chinnam, Associate Professor, Wayne State University, United States
 Evrim Dalkiran, Assistant Professor, Wayne State University, United States

We develop a framework to find optimal assortment for a manufacturer of configurable products dealing with stock-out substitutions. Suggesting a branch and bound approach to solve the mixed-integer nonlinear program, the procedure can solve problems optimally with up to 100 configurations and is being tested by a major automotive OEM.

95	Friday, 03:30 PM - 05:00 PM, River North (Floor 2)	<i>Track:</i> OM and Economic Models
	<i>Session:</i> Economic Models in Operations	
	<i>Chair(s):</i> Yael Grushka-Cockayne Sien Chen	

025-0096 Process-Aware View of the Relationship between Software Architecture and Flexibility Costs
 Sien Chen, Student, Xiamen University, China
 Zhenyu Liu, Professor, Xiamen University, China

The paper demonstrates the relationship between software architecture and costs of flexibility in the case of process-aware software architecture. The proposed relationships are all based on empirical and analytical evidence from large case studies. Process-aware software architecture costs have to be justified by benefits, in particular, generates benefits by supporting business processes.

025-0606 The Wisdom of Competitive Crowds
 Kenneth Lichtendahl, Assistant Professor, University Of Virginia, United States
 Yael Grushka-Cockayne, Assistant Professor, University Of Virginia, United States
 Phillip Pfeifer, Professor, University Of Virginia, United States

We analyze a forecasting competition in which a prize is awarded to the forecaster whose point forecast is closest to an outcome. In a set of equilibrium results, we characterize the strategic forecasting. We find that the competitive crowd's forecast is more accurate than the average of truthful forecasts.

025-0713 Learning to Price from Bounded Rational Competitors
 Guillermo Gallego, Professor, Columbia University, United States
 Kay-Yut Chen, Principal Scientist, Hp Labs, United States
 Jay Wang, Scientist, Hewlett-Packard Laboratories, United States
 Enis Kayis, Scientist, Hewlett-Packard Laboratories, United States
 Shelen Jain, Distinguished Technologist, Hewlett-Packard Laboratories, United States
 Jose Luis Beltran, Senior Scientist, Hewlett-Packard Laboratories, United States

We propose a new pricing method in markets where observed prices may be near, but not on equilibrium. A firm can "learn" from the limited intelligence in the market place. Simulated results show that the level of benefits depends on relative levels of intelligence between the firm and the market.

96	Friday, 03:30 PM - 05:00 PM, Cook (Floor 3)	<i>Track:</i> Supply Chain Risk
	<i>Session:</i> Supply Chain Network Design and Risk Management	
	<i>Chair(s):</i> Hakan Yildiz	

025-1103 A Multi-objective Approach to Design a Robust Pharmaceutical Supply Chain Network
 Mahmood Pariazar, Student, Industrial and Manufacturing Systems Engineering, United States
 Sarah Root, Assistant Professor, Industrial Engineering, United States
 Mustafa Sir, Assistant Professor, Industrial and Manufacturing Systems Engineering, United States

We develop a multi-objective network design model to explore the tradeoffs between costs and risk in pharmaceutical supply chains. We consider various supplier failure scenarios and examine their effect on supplier selection, transportation, and various risks. We use genetic algorithm combined with data envelopment analysis to solve the multi-objective problem.

025-0187 Reliable & Robust Supply Chain Network Design
 Srinivas Talluri, Professor, Michigan State University, United States
 David Closs, Professor, Michigan State University, United States
 Hakan Yildiz, Assistant Professor, Michigan State University, United States

Risk management in supply chains has been receiving increasing attention in the last few years. We present formulations for the strategic supply chain network design problem with two objectives, which usually conflict with each other: minimizing cost and minimizing total risk. We provide some preliminary results.

025-1791 Efficacy of Risk Mitigation Strategies in Supply Chains
 Tom Kull, Assistant Professor, Arizona State University Tempe, United States
 Srinivas Talluri, Professor, Michigan State University, United States
 Hakan Yildiz, Assistant Professor, Michigan State University, United States

We conduct a simulation experiment and DEA to compare the efficacy of seven risk mitigation strategies across nine types of supply chain disruptions. Our results will aid managers in deciding what strategies are better suited for their particular situations.

025-0736 Supply Network Structure, Visibility, and Risk Diffusion: A Computational Approach
 Marcus Bellamy, Student, College of Management, United States
 Rahul Basole, Professor, Tennenbaum Institute, United States

Using a computational network analysis approach, we examine the impact of global supply network structure on risk diffusion and system performance (e.g. supply network health) and illustrate the particular importance of supply network visibility. Our analysis is complemented with an application of network visualization techniques.

97	Friday, 03:30 PM - 05:00 PM, Ballroom G (Floor 5) <i>Session:</i> Service Design and Coproduction <i>Chair(s):</i> Gang Li	<i>Track:</i> Service Operations
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025-1334 A Framework for Integrating Back-Office and Front-Office Service Operations

Mark Davis, Professor, Bentley University, United States
Gang Li, Assistant Professor, Bentley University, United States
Joy Field, Associate Professor, Boston College, United States

Many services are now integrating back-office and front-office operations to increase overall worker efficiency while continuing to provide high levels of customer service. To accomplish effectively, certain issues must be addressed. This paper presents a framework that identifies these issues and the managerial challenges that need to be addressed.

025-0828 Process Improvement in Service Industries

David Hinds, Assistant Professor, Nova Southeastern University, United States

Reported applications of process improvement programs and activities within service industries are reviewed. Application instances are analyzed with respect to industry type, program type, activity type, and Schmenner's service process matrix. Patterns of adoption and usage are noted. Possible explanations are offered leading to future research opportunities.

025-1056 Experiential Service, Moments of Truth, and Behavioral Intentions

Siti Zakiah Abu Bakar, Student, Southern Illinois University Carbondale, United States
John Goodale, Associate Professor, Southern Illinois University Carbondale, United States

Experiential service can be a differentiating factor for service firms. Companies are choreographing customer experience in an attempt to evoke favorable emotions and behavioral intentions, such as loyalty and favorable word of mouth advertising. This study seeks to investigate the mediating role of moments of truth in experiential service.

025-0680 Customer Co-Production resources in Services Processes: Implications for Service Design and Process Efficiency

Stephen Pearce, Student, Univ Of Exeter, United Kingdom
Philip Smart, Professor, Univ Of Exeter, United Kingdom

Service System competitiveness is currently informed by solution oriented customer-centric designs. Such approaches resonate with Service Dominant Logic that emphasizes the co-creation of value with customers. Current theory on Service Process Design, however, excludes an explicit consideration of the impact of co-production on efficiency. This paper addresses this phenomenon.

98	Friday, 03:30 PM - 05:00 PM, Miami (Floor 5) <i>Session:</i> Service Operations in Network Environments <i>Chair(s):</i> Suman Mallik	<i>Track:</i> Service Operations
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025-1330 Television On-air Ad Inventory Decisions Under Competition

Qin Geng, Associate Professor, Kutztown University, United States
Suman Mallik, Associate Professor, University of Kansas, United States

We present a model for managing on-air ad inventory in broadcast television under competition. We present a game theoretic model to solve this problem and derive insights from it.

025-0785 A quantification method for collection effect on consumer term-loans

Zhixin Liu, Assistant Professor, University Of Michigan Dearborn, United States
Zhongsheng Hua, Professor, University Of Science & Technology, China
Ping He, Associate Professor, University Of Science & Technology, China
Xiaoyan Xu, Professor, University Of Science & Technology, China

We study how to quantify the effects of collection actions on the states of consumer term-loan accounts. Modeling the state transitions of loan accounts as Markov transition matrixes, we provide a method for quantifying the effects of collection actions, which provides a theoretical basis for making optimal collection decisions.

025-0792 Managing room reservations in hotel-website game

Xiaoyan Xu, Professor, University Of Science & Technology, China
Ping He, Associate Professor, University Of Science & Technology, China
Huijun Hou, Student, University Of Science & Technology, China
Zhongsheng Hua, Professor, University Of Science & Technology, China

We investigate the problem of managing room reservations in a Stackelberg game between a hotel and a website. We found that the "insistent percentage" (the percentage of the excess online customers over "reserved rooms" applying for reservation via the website) has significant impact on the equilibrium result.

99	Friday, 03:30 PM - 05:00 PM, Minnesota (MN) (Floor 6) <i>Session:</i> Emerging Issues in Inventory and Capacity Management <i>Chair(s):</i> Hyun-soo Ahn Anyan Qi	<i>Track:</i> Inventory Management
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025-0400 Improving Supplier Yield with Spillover

Yixuan Xiao, Student, Washington University St Louis, United States
Yimin Wang, Assistant Professor, Arizona State University Tempe, United States
Nan Yang, Assistant Professor, Washington University St Louis, United States

We study the knowledge spillover effect on manufacturers' supplier improvement efforts. We consider two manufacturers compete in the same market and share a common supplier, which has a production process that is subject to random yield. We model the competition between manufacturers as a two-stage game, and characterize its equilibrium.

025-0399 Financial Hedging and Risk Sharing in a Global Supply Chain

Kyoung-Kuk Kim, Assistant Professor, K A I S T, Korea, Republic of (South Korea)

Kun Soo Park, Assistant Professor, K A I S T, Korea, Republic of (South Korea)

We consider a supply chain of a multinational firm where risk-averse retailer and supplier are exposed to currency-rate uncertainty. We consider two possible strategies for such uncertainty: hedging with currency-options contracts and sharing with risk-sharing contracts. We analyze under which circumstances the central planner and each agent increase their utilities.

025-1761 Inventory Information Disclosure Tactics and Profitability in Internet Retailing

Min Choi, Student, Arizona State University Tempe, United States

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

Should an online retailer divulge (precisely) its stocking level, or merely indicate whether the product is in stock? Using analytical and empirical models, we evaluate how a retailer can enhance profits by appropriately designing an inventory information disclosure policy.

025-0393 Investing in a Shared Supplier in a Competitive Market

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

Amitabh Sinha, Assistant Professor, University Of Michigan Ann Arbor, United States

Anyan Qi, Student, University Of Michigan Ann Arbor, United States

We study the structure and consequences of contracts governing two competing firms' investment strategy to contribute to their shared supplier's capacity expansion plan. Interestingly, even if the firms can reserve priority capacity with this type of investment, the benefit may be mitigated by the spillover to the competitor.

Sessions for Saturday, April 21

Saturday, 08:00 AM - 09:30 AM

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Saturday, 08:00 AM - 09:30 AM, Scottsdale (Floor 5)
Session: Behavioral Studies in Supply Chain Management
Chair(s): Yinghao Zhang

Track: Behavioral Operations

025-0730 Buyback versus Revenue Sharing Contracts: Influence of Retailer's Loss Aversion and Product Evaluation

Karen Donohue, Associate Professor, University Of Minnesota, United States
Yinghao Zhang, Student, University Of Minnesota, United States

We investigate retailer behavior under different supply contracts and find that loss aversion and product evaluation influence both how much a retailer orders and which contract they prefer. We test our theory through a series of experiments and find that product evaluation has less influence on preferences than predicted.

025-0952 Bracing for Demand Shocks in the Supply Chain: Ameliorating Effects of Information Sharing

Travis Tokar, Assistant Professor, Texas Christian University, United States
Matthew Waller, Professor, University Of Arkansas - Fayetteville, United States
Brent Williams, Assistant Professor, University Of Arkansas - Fayetteville, United States
John Aloysius, Associate Professor, University Of Arkansas - Fayetteville, United States

We investigate ordering decisions in the face of an anticipated demand shock. People are known to brace for a negative outcome by overestimating the likelihood of an uncertain event. Two studies manipulate uncertainty of demand shock timing and magnitude. The results identify a decision bias relative to the optimal orders.

025-1275 Consumer Perceptions of Product Recall Strategies: The Effect of Attribution on Repurchase Intent

Tracy Johnson-Hall, Student, Clemson University, United States
Aleda Roth, Professor, Clemson University, United States
Manpreet Hora, Assistant Professor, Georgia Institute Of Technology, United States

We study consumer reactions to different strategies adopted by firms during product recalls. Using a scenario-based experiment in the context of food and pharmaceuticals products, we apply attribution theory to consumer perceptions of risk, regret, disappointment, and repurchase intent subsequent to a product recall.

025-0914 The best strategy in recalls: A service recovery perspective

Xiande Zhao, Professor, The Chinese University Of Hong Kong, Hong Kong
Haiju HU, Student, The Chinese University Of Hong Kong, Hong Kong

Experiment is conducted in Hong Kong and the U.S. to explore the best recall strategy of a company in handling recalls using service-dominant logic, organizational legitimacy theory and fairness heuristic theory. Recall proactiveness and compensation to consumers in recalls are manipulated. This study can help companies out of quality crisis.

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Saturday, 08:00 AM - 09:30 AM, Lincolnshire II (Floor 6)
Session: Empirical Research on Outsourcing, Product Recalls and Quality
Chair(s): John Gray

Track: Empirical Research in OM

025-0644 Antecedents of offshoring and outsourcing decisions in the semiconductor industry

John Gray, Assistant Professor, Ohio State University, United States
Michael Leiblein, Associate Professor, Ohio State University, United States

Using sixteen years of firm, facility, and production sourcing alliance data, we examine the key factors that influence production sourcing decisions in the semiconductor industry. We test predictions of governance (make-buy) and location (domestic-"offshore") based on multiple theoretical perspectives. This work is supported by an NSF grant.

025-0925 Partial Outsourcing: Supplier Advantage and the Bandwagon

Johnny Rungtusanatham, Professor, Ohio State University, United States
Aleda Roth, Professor, Clemson University, United States
David Hall, Student, Clemson University, United States

Prior research establishes that managers partially outsource to gain production leverage, improve governance and reduce supply risk. However, managers also face bandwagon pressure to increase outsourcing to gain a supplier's cost or quality advantage. We empirically test how manager's partial outsourcing is influenced by this pressure.

025-1424 Antecedents of Repurchase Intention by Consumers of Previously Recalled Products

Xiande Zhao, Professor, The Chinese University Of Hong Kong, Hong Kong
Haiju HU, Student, The Chinese University Of Hong Kong, Hong Kong
Barbara Flynn, Professor, Indiana University, United States

This experimental study, based in fairness heuristic theory and organizational legitimacy theory, compares the antecedents of repurchase intention for previously recalled products by consumers in the U.S. and mainland China. Factors include recall proactiveness, level of compensation and degree of product hazard.

025-1684 The Architecture of Multi-Partnering Alliances in R&D Projects: Effects on Product Quality

Aravind Chandrasekaran, Assistant Professor, Ohio State University, United States
Alan MacCormack, Associate Professor, Harvard University, United States
Anant Mishra, Assistant Professor, George Mason University, United States

This research examines why some multi-partnering alliances are more successful than others. We also develop an understanding of how firms should structure their multi-partnering alliances using data from 147 R&D projects.

104	Saturday, 08:00 AM - 09:30 AM, Purdue (Floor 6)	<i>Track:</i> Marketing and OM Interface
	<i>Session:</i> Retail Operations	
	<i>Chair(s):</i> Tamer Boyaci	

025-0279 Timing of Price and Service Level Decisions under Competition and Demand Uncertainty

Olga Perdikaki, Assistant Professor, Texas A&M University College Station, United States
 Dimitris Kostamis, Assistant Professor, University Of North Carolina Chapel Hill, United States
 Jayashankar Swaminathan, Professor, University Of North Carolina Chapel Hill, United States

We study how competition and demand uncertainty affect firms' timing of price and service level decisions relative to demand realization. We model a symmetric duopoly in which firms compete on price and service levels and analytically characterize the Nash equilibrium in the timing of the above decisions.

025-0578 The Interplay between Perceived Quality and Resource Utilization: Does Product Size Matter?

Muge Yayla-Kullu, Assistant Professor, Rensselaer Polytechnic Institute, United States
 Praowpan Tansitpong, Student, Rensselaer Polytechnic Institute, United States

We empirically investigate how customer perceived quality and resource consumption differences of products may impact product line decisions, and how they relate to firms' market performances. We find that capacity utilization is an important aspect and should be considered at the product line design stage for a successful execution.

025-0679 Managing Returns with Opportunistic Customers

Guangzhi Shang, Student, University Of South Carolina, United States
 Bikram Ghosh, Assistant Professor, University Of South Carolina, United States
 Michael Galbreth, Associate Professor, University Of South Carolina, United States

Customers value the ability to return an item if, after a trial period, they find that it does not fit their needs. However, opportunistic customers might use the trial to extract value rather than assess fit. We provide insights into pricing and restocking fees of competing retailers in this context.

025-0856 Private Labels vs. National Brands: Product Assortment and Information Sharing

Arcan Nalca, Assistant Professor, Queens University, Canada
 Saibal Ray, Associate Professor, McGill University, Canada
 Tamer Boyaci, Associate Professor, McGill University, Canada

Direct customer contact provides retailers unique abilities such as learning quickly what customers like and don't like in new products. In light of this concept, we investigate the product assortment and information-sharing decisions in a dynamic supply chain environment and in the presence of store and national brands.

025-0180 Optimal inventory policy for an assortment of vertically-differentiated products

Hari Natarajan, Associate Professor, University Of Miami, United States
 Yalcin Akcay, Assistant Professor, Koc University, Turkey

In many industries, firms offer a variety of substitutable products that customers can choose from. Because product demands are inter-related, managers must determine inventory policies jointly. Considering the case of a vertically-differentiated product assortment, we model and analyze the problem of determining the optimal inventory policy for a product assortment.

105	Saturday, 08:00 AM - 09:30 AM, Great America II (Floor 6)	<i>Track:</i> OM Practice
	<i>Session:</i> Operations Management in the Food and Agriculture Industries	
	<i>Chair(s):</i> Mili Mehrotra	

025-0160 Process Location and Product Distribution with Uncertain Yields

Felipe Caro, Assistant Professor, University Of California Los Angeles, United States
 Kumar Rajaram, Professor, University Of California Los Angeles, United States
 Jens Wollenweber, Senior Manager, University Of California Los Angeles, Germany

In this problem we select the location of processes, the assignment of products and the distribution of production quantities to markets to minimize total expected costs. We model this problem as a mixed non-linear integer program. We present heuristics and lower bounds and discuss application to a large food-processing company.

025-1017 Is IT Access Enough? Evidence from a Natural Experiment in India

Nicos Savva, Assistant Professor, London Business School, United Kingdom
 Kamalini Ramdas, Professor, London Business School, United Kingdom
 Christopher Parker, Student, London Business School, United Kingdom

Reuters offers a subscription service providing local prices of 200+ agricultural products in India via daily text messages. Utilizing an exogenous 12-day ban on text messages as a natural experiment, we find the service decreases geographic price dispersion by 7.6%. Only highly perishable and perishable crops benefit from the service.

025-1432 Improving the Milk Supply Chain in Developing Countries under Competition

Liyang Mu, Student, University Of Texas Dallas, United States
 Milind Dawande, Professor, University Of Texas Dallas, United States
 Vijay Mookerjee, , University Of Texas Dallas, United States

Milk quality issues- arising primarily from deliberate adulteration by producers -- have been widely reported across countries. We identify the root causes of poor milk quality in the current supply chain under competition, and propose a test policy to completely eliminate quality problems under intervention by an interested third party.

106	Saturday, 08:00 AM - 09:30 AM, Dupage (Floor 3)	<i>Track:</i> Scheduling and Logistics
	<i>Session:</i> Secure and Efficient Global Supply Chains	
	<i>Chair(s):</i> Mustafa Cagri Gurbuz	

025-1626 Observations from OASIS Violations Data for Border Inspection
Jonathan Welburn, Student, University Of Wisconsin Madison, United States
Steven Hoerning, Student, University Of Wisconsin Madison, United States
Vicki Bier, Professor, University Of Wisconsin Madison, United States

We use violations data from the FDA Operational and Administrative System for Import Support (OASIS) to assess the risk of food imports by product type and country of origin. The goals are to address rising concerns about food safety, quantify the risks, and explore the usefulness of OASIS data.

025-0655 A Meta-Heuristic Optimization for Scheduling Heat-Treatment Furnace in Steel Casting Industry
Ramasubramaniam Muthurathnasabapathy, Assistant Professor, Loyola Institute of Business Administration, India
Muthu Mathirajan, Associate Professor, Indian Institute of Science, Bangalore, India

This paper addresses a new research problem of scheduling, observed in steel casting industry, related to heat-treatment furnace, to minimize the maximum completion time of all castings. Due to computational intractability, a few greedy heuristic methods and Genetic Algorithm are proposed. A series of computational experiments conducted indicate that the GA implemented has excellent average performance in comparison with a lower-bound.

025-0353 QRA and RBD techniques to evaluate the cost-effectiveness of transport security systems
Luca Urciuoli, Post-doc, Cross-border Research Association, Switzerland

Cargo security has become a major concern for supply chains managers that are asked to identify and invest on cost-effective combinations of security solutions. Hence, the purpose of this paper is to exploit approaches used in the Risk Management discipline to assess the impact of security measures on transport operations.

107	Saturday, 08:00 AM - 09:30 AM, Ballroom A (Floor 5)	<i>Track:</i> Sustainable Operations
	<i>Session:</i> New Products, Competition, and Leasing	
	<i>Chair(s):</i> John Khawam	

025-0588 Collaborate or Compete - When Should Firms Work Together to Eliminate the Use of a Substance of Concern?
Gal Raz, Associate Professor, University Of Virginia, United States
Tim Kraft, Assistant Professor, University Of Virginia, United States

In this paper we analyze the conditions under which it is optimal for firms to collaborate to remove a potentially hazardous substance from their products. We consider the impact of market structure, existing regulatory threat, and market sensitivity on the collaboration decision and how the collaboration costs should be shared.

025-1008 Modularity, New Product Introduction, and Sustainability
Stefan Spinler, Professor, Whu - Otto Beisheim School Of Management, Germany
John Khawam, Assistant Professor, Naval Postgraduate School, United States

When developing new products, manufacturers have the ability to introduce products with varying levels of modularity. Modularity affects both profit and sustainability over multiple generations of the product. We explore these tradeoffs in a game theoretic setting involving a manufacturer and two customers with different discount rates for old products.

025-1241 Option to breach a leasing contract in a fleet replacement problem with electric vehicles
Andrei Neboian, Student, W H U, Germany
Stefan Spinler, Professor, Whu - Otto Beisheim School Of Management, Germany
Paul Kleindorfer, Professor, INSEAD, France

We analyze a fleet replacement problem with electric vehicles and the option to breach the leasing contract, subject to cost uncertainty. We provide a lattice-based approach for finding the optimal solution and bounds. Implications for theory and practice are drawn from applying the model to the French postal operator.

025-1436 Managing Engineering Design for Competitive Sourcing in Closed-Loop Supply Chains
Nagesh Murthy, Associate Professor, University Of Oregon, United States
Tolga Aydinliyim, Assistant Professor, University Of Oregon, United States

We study the design (integral vs. partitioned) and procurement decisions of a buyer and its suppliers' pricing decisions. The integral design requires more virgin materials and eliminates yield loss due to final joining. However, the simpler partitioned design allows a more competitive supplier base to rely less on reverse flows.

108	Saturday, 08:00 AM - 09:30 AM, Denver (Floor 5)	<i>Track:</i> Sustainable Operations
	<i>Session:</i> Green Supply Chains, Ethics, and Supply Chain Relationships	
	<i>Chair(s):</i> Rommert Dekker	

025-0605 Multi-objective decision modeling using Interpretive Structural Modeling (ISM) for Green Supply Chains
Sachin Mangla, Student, Indian Institute Of Technology Roorkee, India
Jitendra Madaan, Assistant Professor, Indian Institute Of Technology Roorkee, India

Determining key variables, which an organization can opt to initiate green supply chain activities with a motive to improve overall performance is a challenge. Therefore this paper provides a multi-objective decision model using interpretive structural modeling (ISM) based approach to enrich and initiate the green supply chain activities in an organization. Variables such as supplier commitment, cost, regulations etc. have been identified and categorized under enablers and capacity utilization, customer satisfaction, energy consumption etc. under results. These enablers help to boost the GSC (Green Supply Chain) variables, while results variables represent outcomes. Finally, paper interprets GSC variables in terms of their driving and dependence powers that have been carried out.

025-1134 Ethics issues in supply management: from a literature review to a conceptual framework

Jalba Miniussi, Student, Fundacao Getulio Vargas, Brazil
 Janaina Siegler, Student, Fundacao Getulio Vargas, Brazil
 João Mario Csillag, Professor, Fundacao Getulio Vargas, Brazil

Ethics is an important dimension of corporate social responsibility. This study presents a review of relevant empirical research focused on the ethical issues concerning the buyer-supplier relationship as well those present along the supply chain, showing their conceptual evolution. Emerging from the review, a conceptual framework is proposed.

025-1170 Closed Loop Supply Chain: Rethinking the way we do things

Renê Bergel, Professor, Pontifical Catholic University Of Parana, Brazil
 Ubiratan Tortato, Assistant Professor, Pontifical Catholic University Of Parana, Brazil

The purpose of this article is to show how the use of Closed Loop Supply Chain (CLSC) can provide a competitive advantage when we adopt sustainable practices. Literature review was used to identify the CLSC concept and their applicability to business opportunities. It also presented success stories.

025-1667 Greening supply chain design: evaluating the trade-offs

John Mallidis, Student, Aristotle University of Thessaloniki, Greece
 Rommert Dekker, Professor, Erasmus University Rotterdam, Netherlands
 Dimitrios Vlachos, Associate Professor, Aristotle University of Thessaloniki, Greece

In this paper we present a MIP model to assess the effects of various environmental objectives on supply chain design. Apart from the standard aspects we also consider leasing / dedicated use of DCs and transport. We apply the model to a supply chain of white goods in SE-Europe.

109	Saturday, 08:00 AM - 09:30 AM, Ballroom H (Floor 5) <i>Track:</i> Humanitarian Operations and Crisis Management
	<i>Session:</i> Panel: SCM Disruptions: Research Agenda
	<i>Chair(s):</i> Nada Sanders Martin Starr

025-1693 SCM Disruptions: Research Agenda

Nada Sanders, Professor, Lehigh University, United States
 Martin Starr, Emeritus Professor, Rollins College, United States
 Sushil Gupta, Professor, Florida International University, United States

Global Supply chains are vulnerable to disruptions due to natural as well as the man-made disasters. This panel will discuss research challenges and opportunities to address the anticipation, preparation, and reaction to supply chain disruptions. The objective is to develop a research agenda that addresses relevant and pending research opportunities.

110	Saturday, 08:00 AM - 09:30 AM, Illinois (IL) (Floor 6) <i>Track:</i> Manufacturing Operations
	<i>Session:</i> Manufacturing Decision Making using Empirical Data
	<i>Chair(s):</i> Johannes Ixmeier

025-0380 Product Recalls and the Shop-Floor: How Manufacturing Decisions Can Influence Product Recalls

Rachna Shah, Associate Professor, University Of Minnesota, United States
 Arthur Hill, Professor, University Of Minnesota, United States
 George Ball, Student, University Of Minnesota, United States

Product recall research is focused on market outcomes following a recall. Using econometric methods, we empirically examine shop-floor variables that are related to product recalls in the automotive industry. Our findings suggest that operations managers can have a significant impact on the likelihood of product recalls by their firm.

025-0984 Revisiting the lean-ERP Paradox: ERP support for the respect-for-human system

Daryl Powell, Student, NTNU, Norway

The lean-ERP paradox suggests a synergy in combining ERP systems with lean production. Though this has been demonstrated in the context of production planning and control (e.g. kanban), the effects of ERP systems on the respect-for-human system are far less explored. This paper investigates ERP support for the respect-for-human system.

025-1204 Decentralized value creation on global scale: investigating transnational elements in worldwide manufacturing

Lothar Czaja, Student, Friedrich-Alexander Universitat Erlangen-Nurnberg, Germany
 Johannes Ixmeier, Student, Friedrich-Alexander Universitat Erlangen-Nurnberg, Germany
 Kai-Ingo Voigt, Professor, Friedrich-Alexander Universitat Erlangen-Nurnberg, Germany

Numerous effects are forcing MNC to configure their production network on global scale. Hence, the single plant's roles are broadened, with competence enrichment at the single sites. Hereby reciprocal interdependencies among each other are developed. The study investigates coordination elements capable to cope with upcoming decentralization in today's global operations.

111	Saturday, 08:00 AM - 09:30 AM, Ballroom B (Floor 5) <i>Track:</i> Supply Chain Management
	<i>Session:</i> Best Paper Competition
	<i>Chair(s):</i> Gal Raz

025-1829 New Functional Characterizations and Optimal Structural Results for Assemble-to-Order M-Systems

Emre Nadar, Student, Carnegie Mellon University, United States
 Mustafa Akan, Assistant Professor, Carnegie Mellon University, United States
 Alan Scheller-Wolf, Professor, Carnegie Mellon University, United States

We consider an assemble-to-order "M-system" with multiple components and products, batch ordering, and lost sales. Introducing new functional characterizations for submodularity and supermodularity, we show the optimality of a lattice-dependent base-stock and lattice-dependent rationing policy, specifying whether to produce a batch of components and/or an arriving demand should be satisfied.

025-0498 Impact of Strategic Customer Behavior and Rollover Strategies on Product Innovation

Metin Cakanyildirim, Associate Professor, University Of Texas Dallas, United States
Suresh Sethi, Professor, University Of Texas Dallas, United States
Chao Liang, Student, University Of Texas Dallas, United States

A firm's optimal profit and innovation investment are analyzed in four scenarios: when the customers are myopic or strategic, and when single or dual rollover is adopted. We show that the innovation and profit can be improved simultaneously with strategic customers, and strategic waiting behavior speeds up the innovation process.

025-1830 Investing in a Shared Supplier in a Competitive Market

Anyan Qi, Student, University Of Michigan Ann Arbor, United States
Hyun-soo Ahn, Associate Professor, University Of Michigan Ann Arbor, United States
Amitabh Sinha, Assistant Professor, University Of Michigan Ann Arbor, United States

We study the structure and consequences of contracts governing two competing firms' investment strategy to contribute to their shared supplier's capacity expansion plan. Interestingly, even if the firms can reserve priority capacity with this type of investment, the benefit may be mitigated by the spillover to the competitor.

025-1831 Electric Vehicles with a Battery Switching Station: Adoption and Environmental Impact

Karan Girotra, Assistant Professor, INSEAD, France
Serguei Netessine, Emeritus Professor, INSEAD, France
Buket Avci, Student, INSEAD, France

We analyze a novel switching-station based business model for the deployment of electric vehicles. In contrast with the traditional automobile sales, customers are charged for the service of miles driven. We compare this new service model to the traditional EV sales model in terms of market adoption and environmental impact.

112	Saturday, 08:00 AM - 09:30 AM, Houston (Floor 5) <i>Session:</i> Global Sourcing <i>Chair(s):</i> Tracy Johnson-Hall	<i>Track:</i> Supply Chain Management
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025-0887 The Role of Global Direct Sourcing in Supply Chain Strategy

Qiong Chen, Student, Clemson University, United States
Tracy Johnson-Hall, Student, Clemson University, United States
Aleda Roth, Professor, Clemson University, United States

This study compares global direct sourcing (GDS) with traditional intermediated sourcing strategies. While GDS can provide some relative advantages over traditional sourcing, it is characterized by high levels of complexity and may introduce new sources of supply risk. We discuss when GDS can be advantageous as well as risk mitigation.

025-0475 Global Supply Chain Network Competition under Exchange Rate Uncertainty

Zugang Liu, Assistant Professor, Penn State University Philadelphia, United States

We study the impact of foreign exchange uncertainty on global supply chain networks. We consider multiple multinational firms who make decisions regarding procurement, global production, product allocation, transportation, and sales of the products. Our studies revealed interesting managerial insights regarding the profitability, risk, and operation strategies.

025-1620 Supply chain configuration design using design of experiment approach

Bu-Yuan Zhang, Student, Tunghai University, Taiwan, Republic of China
Chen Yang Cheng, Assistant Professor, Tunghai University, Taiwan, Republic of China

Due to the global competition, industries have to consider supply chain configuration before building their supply chain network. The configuration may include site allocation, supply chain layer design, logistics plan, and etc. This paper exams the optimal setting to prevent bullwhip effect using design of experiment and simulation approaches.

025-1610 Describing Regional Knowledge Sharing in the Supply Chain: A Non-Cooperative Game-Theoretic Approach

Miguel Estrada, Professor, Ipade Business School, Mexico
Jesus Orozco, Assistant Professor, Ipade Business School, Mexico

Manufacturing competitors in the same region commonly have similar production strategies developed with similar knowledge. They compete against similar organizations in other regions to win manufacturing contracts. In this paper, we propose a game-theoretic approach to describe strategies and their implications when competitors share knowledge to improve regional competitiveness.

113	Saturday, 08:00 AM - 09:30 AM, Watertown (Floor 10) <i>Session:</i> The Impact of Information Asymmetry on Supply Chains <i>Chair(s):</i> Mehmet Gumus	<i>Track:</i> Supply Management
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025-0137 The value of process improvement under supply risk in the presence of Information Asymmetry

Mohammad Nikoofal, Student, Mcgill University, Canada
Mehmet Gumus, Assistant Professor, Mcgill University, Canada

In this paper, we explore the effectiveness of process improvement as a supply disruption mitigation strategy in the presence of moral hazard and adverse selection. In order to address these issues, we develop a dyadic supply chain model where both the degree of supply disruption risk and supplier's mitigation effort are unobservable from retailer.

025-1145 Subcontracting in the Presence of Transactional and Contractual Customers

Tolga Aydinliyim, Assistant Professor, University Of Oregon, United States
 Zhibin Yang, Assistant Professor, University Of Oregon, United States
 George Vairaktarakis, Professor, Case Western Reserve University, United States

We consider a supply chain setting whereby a supplier, after committing to long-term customers, contracts remaining capacity with a short-term customer who cannot meet a due date unless he (partially) subcontracts. We study coordinating contracts, and discuss how the short-term customer's private due date information affects pricing and subcontracting decisions.

025-1181 Sub-tier Supply Risk Management Under Asymmetry of Information

Tamer Boyaci, Associate Professor, McGill University, Canada
 Saibal Ray, Associate Professor, McGill University, Canada
 Mohammadjavad Samieenia, Student, McGill University, Canada

Because risk in multi-tier supply chains comes not only from direct but also from sub-tier suppliers, devising strategies to manage only direct suppliers' disruption risks may not be sufficient. We study risk mitigation strategies of an OEM when he addresses the risk in different tiers under lack of sufficient visibility.

025-0871 Multi-Period Sourcing Strategy under Demand and Supply Uncertainty with Two Suppliers

P Sundararaghavan, Professor, University Of Toledo, United States
 Shantanu Bagchi, Student, IFHE, Hyderabad, India

Presence of a local and a global supplier for the same part is a common scenario in many industries. In this paper, we present a calculus based model to find the optimal sourcing policy in a multi-period environment with supply and demand uncertainty.

114	Saturday, 08:00 AM - 09:30 AM, Ballroom F (Floor 5)	<i>Track:</i> Product Innovation and Technology Management
	<i>Session:</i> Innovation in Pharmaceutical Industry	
	<i>Chair(s):</i> Cheryl Druehl	

025-0821 Pharmaceutical R&D Alliances: Joint Ventures vs. Licensing Agreements

Niyazi Taneri, PhD Candidate, Cambridge University, United Kingdom
 Arnoud De Meyer, Professor, Singapore Management University, Singapore

We develop two separate models for an equity licensing game and an equity joint venture game between a Partner and Innovator with a view of understanding the choice between the two types of R&D alliances. Hypotheses that stem from the theoretical models are tested with data from the Pharmaceutical Industry.

025-1595 Investment to Accelerate the Adoption of New Medical Devices

Zhili Tian, Assistant Professor, Towson University, United States
 Cheryl Druehl, Assistant Professor, George Mason University, United States

The adoption of a FDA approved medical device depends on scientific evidence, availability and promotion of the product, and education and support services. We use continuous glucose monitoring (CGM) technology as an example. We analyze how post-market clinical studies, reimbursement, and support decisions affect the adoption of the device.

025-1637 Pharmaceutical Production Capacity Investment Decisions and Dynamic Estimation of Trial Success

Phil Kaminsky, Associate Professor, University Of California Berkeley, United Kingdom
 Ming Yuen, Student, University Of California Berkeley, United States

We consider a pharmaceutical firm making capacity investment decisions for a product undergoing clinical trials. We explore approaches for periodically re-evaluating and optimizing production capacity investment decisions as the probability of passing the required clinical trials is updated.

115	Saturday, 08:00 AM - 09:30 AM, Los Angeles (Floor 5)	<i>Track:</i> OM in China/East Asia
	<i>Session:</i> OM Theories and Practices in China/East Asia	
	<i>Chair(s):</i> Lucy Chen	

025-0509 Do Supply Chain Relationships Influence Inventory Turnover and Operating Margin? Some Evidence from Manufacturers

Qing Ye, Assistant Professor, Tsinghua University, China
 Wei Chi, Associate Professor, Tsinghua University, China
 Barbara Flynn, Professor, Indiana University, United States
 Shanshan Hu, Assistant Professor, Indiana University Bloomington, United States

Using data collected by the World Bank, we empirically investigate the connection between Chinese manufacturers' supply chain relationships, raw material and finished goods inventory turnover, and operating margin. We find that the relative power of the manufacturer over suppliers and customers has a significant impact on inventory performance.

025-0787 Product Recoveries in China: Remanufacturing vs. Refurbishing

Yao Chen, Associate Professor, Shanghai Institute of Foreign Trade, China
 Fangruo Chen, Professor, Columbia University, United States

The markets for recovered products in China often consist of both remanufactured and refurbished products. We characterize the equilibrium market structure when all the three products (new, remanufactured, and refurbished) compete with each other with a special emphasis on the conditions under which the remanufactured products can survive the competition.

025-1147 Demystifying Manufacturing Competitiveness of USA/Canada and China

Atanu Chaudhuri, Assistant Professor, Indian Institute Of Management Lucknow, India
 Craig Giffi, Vice Chairman, Deloitte & Touche USA LLP, United States
 Aleda Roth, Professor, Clemson University, United States

Drawing upon the Global Competitiveness in Manufacturing Initiative, we report on how manufacturing CEOs, headquartered in China and USA Canada, view their relative country competitiveness. By contrasting aggregate-level, country level manufacturing capabilities and competencies, policies, and other factors, we offer insights that contribute to a country's manufacturing prowess.

025-0252 Behavioral Tendencies in Newsvendor Decision Making: Capturing the Chinese Perspective

Lucy Chen, Assistant Professor, National University Of Singapore, Singapore
 Srinagesh Gavirneni, Associate Professor, Cornell University, United States
 Jian Chen, Professor, Tsinghua University, China
 Yin Cui, Student, Tsinghua University, China

Using the technique of Verbal Protocol, we design experiments to study the decision making process of newsvendor subjects. We then compare the results from the US subjects with those from the Chinese subjects, and identify the similarity and difference between these two groups.

025-0259 Barriers in implementing reverse logistics in Chinese manufacturing sectors: An empirical analysis

Muhammad Abdulrahman, Assistant Professor, University Of Nottingham, China
 Nachiappan Subramanian, Associate Professor, Nottingham University Business School, China

This study attempts to empirically understand various barriers in reverse logistics implementation from firms' perspective in Chinese manufacturing sectors. This study identifies major barriers related to management, finance, policy and infrastructure. Contingency analysis is carried out to understand the similarities and differences in barriers among multinational firms and domestic firms.

116	Saturday, 08:00 AM - 09:30 AM, Northwestern (Floor 6) <i>Session:</i> Operations/Marketing Interface <i>Chair(s):</i> John Turner	<i>Track:</i> Product Management
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025-1408 Analyzing B2B Sales and Pricing Decisions

Wolfgang Jank, Associate Professor, University Of Maryland, United States
 Wedad Elmaghaby, Associate Professor, University Of Maryland, United States
 Itir Karaesmen, Assistant Professor, American University, United States

Sales people are responsible of pricing decisions in many B2B transactions. We study how sales people adjust price quotes over time. With data from a grocery products distributor, we show that price changes are best characterized by a two-stage model.

025-0833 A study of quality management in software process production: a diagnostic in a software development area

Wagner Lucato, Professor, Universidade Nove De Julho, Brazil
 José Salles, Professor, Universidade Nove De Julho, Brazil
 Gabriel Baptista, Assistant Professor, Universidade Nove De Julho, Brazil
 Milton Vieira Junior, Professor, Universidade Nove De Julho, Brazil

This paper presents standards and models related to software quality management and a field research in a software project department aiming to evaluate the employees' perceptions about software development. The results indicate a low maturity company in software development with low knowledge about these standards and models.

025-0365 Aligning Product Mix and Supply Chain Strategies: An Empirical Analysis

Kyoungsun Lee, Student, Purdue University, United States
 Ananth Iyer, Professor, Purdue University, United States

We develop empirical links between product variety, demand and associated demand uncertainty. We show that demand forecasting challenges increase in variety at an increasing rate but can be mitigated by synchronizing variety and customer segments and by selecting the right inventory locations and sharing strategies.

025-0964 Analyzing the cost effects of modularity - a multidimensional approach

Henning Skirde, Student, Institute of Business Logistics and General Management, Germany
 Wolfgang Kersten, Professor, Institute of Business Logistics and General Management, Germany
 Max Feser, Student, Institute of Business Logistics and General Management, Germany
 Meike Schroeder, Student, Institute of Business Logistics and General Management, Germany

Modularity has become a concept of increased focus recently. In order to achieve the several advantages that this kind of product structure provides, a number of cost effects have to be considered coherently. We present initial results of a multidimensional approach that enables companies to assess these cost effects.

117	Saturday, 08:00 AM - 09:30 AM, Ballroom C (Floor 5) <i>Session:</i> Quality and Patient Safety <i>Chair(s):</i> Kathleen McFadden	<i>Track:</i> Healthcare Operations
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025-0192 The Role of CQI, Leadership and Safety Climate in Hospital Quality and Safety Performance

Gregory Stock, Professor, University Of Colorado Colorado Springs, United States
 Charles Gowen III, Professor, Northern Illinois University, United States
 Kathleen McFadden, Professor, Northern Illinois University, United States

We present a research model that demonstrates how transformational leadership, safety climate and continuous quality improvement initiatives are related to objective quality and patient safety performance measures. The proposed framework is tested using structural equation modeling, based on data collected for 205 hospitals.

025-0641 Using DEA to evaluate quality performance in cardiology

Gregory Stock, Professor, University Of Colorado Colorado Springs, United States
 Muge Yayla-Kullu, Assistant Professor, Rensselaer Polytechnic Institute, United States
 Liam O'Neill, Associate Professor, University Of North Texas, United States

Christopher McDermott, Associate Professor, Rensselaer Polytechnic Institute, United States

This paper presents results from the use of DEA to study multiple cardiology quality metrics simultaneously from a group of NY hospitals to determine the best performers. Our results demonstrate how this technique can identify organizations that might otherwise be overlooked as high performers using traditional, single-dimension methods.

025-0857 Designing Safer Systems in Healthcare: Understanding the Drivers of Patient Safety

Filipa Fonseca, Student, Universidade Nova De Lisboa, Portugal
Paulo Gomes, Lecturer, Massachusetts Institute Of Technology, United States

The study analyzes categories of patient safety and presents a conceptual framework that explains how healthcare systems enter unsafe modes. It develops a systems causation model of how accidents and hazards arise and explores mechanisms to address them. The findings provide guidance for failure prevention and patient safety improvement.

025-0007 Continuous Quality Improvement, Six Sigma, and Lean Management Programs in U.S. Hospitals

Kathleen McFadden, Professor, Northern Illinois University, United States
Charles Gowen III, Professor, Northern Illinois University, United States

Continuous Quality Improvement (CQI), Six Sigma (SS), and Lean Management (LM) are examined for a survey of 210 U.S. hospitals. For medical error sources amelioration, CQI and LM mediate for patient safety outcomes; CQI and SS mediate for improving organizational effectiveness; and SS mediates for superior sustainable competitive advantage.

118	Saturday, 08:00 AM - 09:30 AM, Kansas City (Floor 5)	<i>Track:</i> Healthcare Operations
	<i>Session:</i> Improving Healthcare Delivery	
	<i>Chair(s):</i> Yue Zhang	

025-1669 Alliances in Biopharmaceutical Industry: A Minefield of Missteps
JoJo Samad, Sr. Clinical Quality Associate, Abbott Laboratories, United States
Arvinder Loomba, Professor, San Jose State University, United States

Success of new pharmaceutical product is correlated with firm's marketing might as well as with its technological prowess. We examine the case of failed pharmaceutical product launch of Exubera and tracing it to an ineffective alliance of Nektar with Pfizer leading to poor marketing strategy and address specific operational hurdles.

025-1013 Design of a Long-Term Care Facility Network
Paul Intrevado, Student, Mcgill University, Canada
Vedat Verter, Professor, Mcgill University, Canada

Lack of capacity in long-term care facilities significantly impacts bed-blocking in acute-care hospitals. A dynamic location and capacity model for long-term care facilities is modeled as a mixed-integer program. An illustrative example based on data from Montreal, Canada is presented. The model, as well as preliminary results, are discussed.

025-0086 Models, evidence and theory in health service operations: A literature review.
Mahdi Mahdavi, Student, Erasmus University Rotterdam, Netherlands
Tomi Malmstrom, Student, Aalto University, Finland
Joris van de Klundert, Professor, Erasmus University Rotterdam, Netherlands
Sylvia Elkhuisen, Assistant Professor, Erasmus University Rotterdam, Netherlands
Jan Vissers, Professor, Erasmus University Rotterdam, Netherlands

We explore if and how scientific literature on health service operations has resulted in accumulation of knowledge and generally applicable theory. Four main questions are investigated: 1) Why are models used? 2) Where are models used? 3) How models are developed? and 4) What are the achievements, in particular regarding implementation.

025-0746 The Impact of Client Choice on Medical Facility Network Design
Derek Atkins, Professor, University Of British Columbia, Canada
Yue Zhang, Assistant Professor, University Of Toledo, United States

This talk describes a methodology for optimizing the facility network of a health service provider to maximize its market share in a competitive environment. Facility locations and capacities are the main determinants. With two different assumptions about client choice, we formulate the problems as mathematical programs with equilibrium constraints.

119	Saturday, 08:00 AM - 09:30 AM, Wisconsin (WI) (Floor 6)	<i>Track:</i> Retail Operations
	<i>Session:</i> Retail Operations V	
	<i>Chair(s):</i> Ramnath Vaidyanathan	

025-1188 The Multi-product Newsvendor Problem with Dynamic Substitution
Amr Farahat, Assistant Professor, Washington University St Louis, United States
Joonkyum Lee, Student, Cornell University, United States

We study the stocking problem facing a newsvendor offering multiple products where customer choice depends on the set of available products at the time of purchase. We present a tractable approach, guaranteed to yield upper bounds on the optimal value, and numerical results that outperform current benchmarks.

025-1516 Does Inventory Increase Sales? The Billboard and Scarcity Effect in the U.S. Automobile Dealership
Santiago Gallino, Student, University Of Pennsylvania, United States
Marcelo Olivares, Assistant Professor, Columbia University, United States
Gerard Cachon, Professor, University Of Pennsylvania, United States

Inventory analysis and inventory practice have traditionally been based on the assumption that underlying demand does not vary with inventory level. Using a unique dataset we develop a model that helps identifying inventory effect on sales.

025-1625 Assortment Planning: A Sensitivity Analysis

Ramnath Vaidyanathan, Assistant Professor, McGill University, Canada

We investigate two important issues in assortment modeling: the impact of (1) ignoring stock-out substitution and (2) using an incorrectly specified choice model, on the optimal assortment and profits. We quantify their effects in terms of the maximum percentage gap from the optimal solution and study its variation.

025-0172 SCM Practices Impact on Supplier Partnering in Small Retailers

James Hamister, Assistant Professor, Wright State University, United States
Michael Braunscheidel, Assistant Professor, Canisius College, United States

We study the impact of supply chain management practices on supplier partnering and performance of small retailers. Surveys were conducted among small retailers in western New York State. Small retailers with greater implementation of SCM practices had higher levels of supplier partnerships at retail and supplier levels.

120	Saturday, 08:00 AM - 09:30 AM, River North (Floor 2)	<i>Track:</i> Vendor and Supply Contracts
	<i>Session:</i> Procurement Strategy and Supply Contracts	
	<i>Chair(s):</i> Shanshan Hu	

025-0338 Investing in Supplier Capacity: Cost-sharing Mechanisms and Experimental Tests

Zhixi Wan, Assistant Professor, Hec Paris, France
Qing Ye, Assistant Professor, Tsinghua University, China
Wei Chi, Associate Professor, Tsinghua University, China
Shanshan Hu, Assistant Professor, Indiana University Bloomington, United States

Taking a buyer's perspective, we investigate if simple cost-sharing mechanisms can induce capacity investment from competing suppliers. We show that linear-sharing mechanism can achieve this goal but reduces the buyer's profit, and this short-coming can be solved by a modified target-sharing mechanism. Experiment studies confirm our theoretical predictions.

025-0345 Does Pooling Component Demands when Sourcing Lead to Higher Profits?

Izak Duenyas, Professor, University Of Michigan Ann Arbor, United States
Damian Beil, Associate Professor, University Of Michigan Ann Arbor, United States
Bin Hu, Assistant Professor, Kenan-Flagler Business School, United States

When two buyers purchase a component from a powerful supplier to satisfy random future demands, the classic pooling logic indicates that pooling the two demands improves profits. However, we show when the supplier designs optimal contracts, pooling will not always improve profits, and gain insights into why this is happening.

025-0486 The Roles of Bank and Trade Credits: Theoretical Analysis and Empirical Evidence

Xiangfeng Chen, Associate Professor, Fudan University, China
Zhiguo Xiao, Associate Professor, Fudan University, China
Gangshu Cai, Associate Professor, Kansas State University, United States

This paper investigates the roles of bank and trade credits in a supply chain with a capital constrained retailer, where the retailer can borrow credit from a bank and/or from the supplier who allows delayed payment. We provide both analytical results and empirical evidence.

025-1274 Strategic use of procurement service providers

Sripad Devalkar, Assistant Professor, Indian School Of Business, India
Zhixi Wan, Assistant Professor, Hec Paris, France

Procurement service providers (PSP) are widely used by buyers in global sourcing. Given a variety of services offered by a PSP, we study what services a buyer should use and how it can contract with the PSP, so as to minimize its sourcing costs and risks.

121	Saturday, 08:00 AM - 09:30 AM, Cook (Floor 3)	<i>Track:</i> Supply Chain Risk
	<i>Session:</i> Measuring and Managing Risk in Supply Chains	
	<i>Chair(s):</i> Nikolay Osadchiy	

025-1404 Systematic Risk and the Bullwhip Effect in Supply Chains

Vishal Gaur, Associate Professor, Cornell University, United States
Sridhar Seshadri, Professor, University Of Texas Austin, United States
Nikolay Osadchiy, Assistant Professor, Emory University, United States

We investigate the degree of systematic risk in supply chains and its causes using industry-level data for manufacturers, wholesalers, and retailers in the U.S. economy. Our findings have implications for the type of operational and financial hedging strategy that a firm should choose.

025-0702 A Framework for Conceptualizing and Managing Supply Chain Risks

Ram Kumar, Professor, University Of North Carolina Charlotte, United States
Sungjune Park, Associate Professor, University Of North Carolina Charlotte, United States

We present a framework for conceptualizing and evaluating different types of risks and risk mitigation strategies in the context of supply chain management. This framework is based on the finance literature on security valuation and can be used to compare alternative supply chain designs.

025-0882 Risk Mitigation of Production Hedging

John Park, Student, Syracuse University, United States
Burak Kazaz, Associate Professor, Syracuse University, United States
Scott Webster, Professor, Syracuse University, United States

This research analyzes the influence of exchange-rate risk on a global manufacturer's pricing and production decisions. The firm is allowed to follow production hedging, defined as producing less than its total demand; it also complies with a Value at Risk constraint where its losses are limited in amount and probability.

025-1510 Financial distress of suppliers: Organizational responses and learning of buying firms

Stephan Wagner, Professor, Swiss Federal Institute Of Technology Zurich, Switzerland
 Christoph Bode, Assistant Professor, Swiss Federal Institute Of Technology Zurich, Switzerland

Supplier default risk has become a major issue for buying firms. Using in-depth case studies conducted among European and Latin American firms, we develop a set of propositions about how buying firms scan, interpret, and manage financially distressed suppliers and how they learn from prior supplier default experiences.

122	Saturday, 08:00 AM - 09:30 AM, Ballroom G (Floor 5) <i>Session:</i> The Role of National Culture in Services <i>Chair(s):</i> Richard Metters	<i>Track:</i> Service Operations
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025-0391 General Overview of National Culture in Services

Richard Metters, Professor, Texas A&M University College Station, United States

A qualitative, practical discussion of examples in which national culture can alter the service environment. Examples from hotels, call centers, and airlines will be included.

025-0575 Impact of national culture on service quality

Praowpan Tansitpong, Student, Rensselaer Polytechnic Institute, United States
 Jeffrey Durgee, Associate Professor, Rensselaer Polytechnic Institute, United States
 Muge Yayla-Kullu, Assistant Professor, Rensselaer Polytechnic Institute, United States
 Christopher McDermott, Associate Professor, Rensselaer Polytechnic Institute, United States

We investigate the impact of national culture on service operations. Hofstede's power distance index is used to measure cultural differences. In the literature, results are conflicting in terms of the relationship between power distance and service quality. By using objective service quality measurements, we aim to provide unbiased insights.

025-0954 Service Design Case Study by servicescape and service blueprint in the coffee shop

Youn Sung Kim, Professor, Inha University, Korea, Republic of (South Korea)

Servicescape and service blueprint may be used to improve the current service delivery system. Around the campus there are so many coffee shops in Inha University in Incheon, South Korea. In this study the current service delivery design will be assessed and then suggestion will be added.

123	Saturday, 08:00 AM - 09:30 AM, Miami (Floor 5) <i>Session:</i> Game-Theoretic Models in Operations <i>Chair(s):</i> Ilan Lobel Ozan Candogan	<i>Track:</i> OM and Economic Models
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025-0402 Social Norms in Queues

Eran Hanany, Associate Professor, Tel Aviv University, Israel
 Gad Allon, Associate Professor, Northwestern University, United States

In many service settings customers have adopted self-enforcing priority rules. While in some cases, all customers are served according to the order in which they arrive, cutting the line is possible in other systems. We provide conditions under which these intrinsic priorities may emerge. Our results suggest that when priority

025-0131 Optimal Dynamic Supply Contracts with Backlogging and Lost Sales

Wenqiang Xiao, Assistant Professor, Stern School of Business, United States
 Hamid Nazerzadeh, Assistant Professor, Marshall School of Business, United States
 Ilan Lobel, Assistant Professor, New York University, United States

We study the problem of finding optimal dynamic supply contracts when the retailer has private demand and inventory information. We show that, in the case of backlogging, the optimal mechanism is a menu of wholesale prices. For lost sales, a menu of wholesale prices with an embedded option is optimal.

025-0613 Framework Agreements for Procurement: A Model and Design Recommendations

Yonatan Gur, Student, Columbia University, United States
 Gabriel Weintraub, Associate Professor, Columbia University, United States

Framework agreements (FAs) are procurement mechanisms that are used to satisfy demand that arises randomly over time. We develop the first theoretical analysis of suppliers' risks in FAs, focusing on cost uncertainty. Our results provide important prescriptions that are being used by the Chilean government to improve their FAs' design.

025-1031 Optimal Pricing in Networks with Externalities

Ozan Candogan, Student, Massachusetts Institute Of Technology, United States
 Asuman Ozdaglar, Associate Professor, Massachusetts Institute Of Technology, United States
 Kostas Bimpikis, Assistant Professor, Stanford University, United States

We characterize the optimal pricing strategies of a monopolist selling a divisible good to consumers who are embedded in a social network. Assuming that the consumers experience a (positive) local network effect, we establish that the optimal pricing strategy can be expressed as a function of agents' network centrality.

124	Saturday, 08:00 AM - 09:30 AM, Minnesota (MN) (Floor 6) <i>Session:</i> Dynamic Inventory Management <i>Chair(s):</i> Wanshan Zhu	<i>Track:</i> Inventory Management
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025-1578 Optimal Pricing when Secondary Products are Available

Craig Sorochnik, Assistant Professor, University of Wyoming, United States
 John Wilson, Professor, Ivey School of Business, Canada

In many industries (such as the airline industry) secondary revenues (e.g. baggage fees) are at least as important as primary ones (e.g. ticket prices). We consider how much inventory to hold and what prices to charge for both primary and secondary items.

025-1582 Design and Analysis of Mechanisms for Decentralized Joint Replenishment

Alper Sen, Assistant Professor, Bilkent University, Turkey
Kemal Guler, Principal Research Scientist, Hp Labs, United States
Evren Korpeoglu, Research Scholar, Bilkent University, Turkey

We consider finding mechanisms that would allocate the joint replenishment costs to non-cooperative firms based on their reported adjusted demand rates. We show that there is no direct mechanism that simultaneously achieves efficiency, incentive compatibility and budget- balance. Then, we propose parametric mechanisms and investigate the corresponding firm behavior and equilibrium.

025-1254 Joint Replenishment and Ordering in Substitutable Multi Product Inventory Systems

Ufuk Kula, Assistant Professor, Sakarya University, Turkey
Beyazit Ocaktan, Student, Sakarya University, Turkey

We consider a problem motivated by a bank's ATM operations. We study a fully substitutable multi product inventory system (banknotes in an ATM) in which customer demand may be satisfied by delivering any combination of products. We model the system as an MDP and solve it by using Approximate DP.

025-1746 The Newsvendor's Optimal Incentive Contracts for Multiple Advertisers

Wanshan Zhu, Associate Professor, Tsinghua University, China
zhengping Wu, Assistant Professor, Singapore Management University, Singapore
Pascale Crama, Assistant Professor, Singapore Management University, Singapore

We consider a newsvendor who earns revenue from the sales of her product to end users as well as from multiple advertisers paying to obtain access to those end users. We study the optimal decisions of a price-taking and a price-setting newsvendor when the advertisers have private information.

126	Saturday, 11:15 AM - 12:45 PM, Scottsdale (Floor 5)	<i>Track:</i> Supply Management
	<i>Session:</i> Game Theory Models in Supply Management	
	<i>Chair(s):</i> Xiao Huang	

025-0185 Vendor Selection, Contract Efficiency and Performance Measurement in Service Outsourcing
Sameer Hasija, Assistant Professor, INSEAD, Singapore
Zhijian Cui, Assistant Professor, IE Business School, Spain

This study compares the vendor selection and contract efficiency in service outsourcing. It shows that competitive bidding yields good selection but contract inefficiency; while the sequential process enables outsourcing firms to achieve perfect efficiency but results in poor vendor selection. It also highlights multiple implications of performance measurements in service.

025-0248 Supply Chain Intermediation When Retailers Lead
Elodie Adida, Assistant Professor, University of Illinois at Chicago, United States
Victor DeMiguel, Associate Professor, London Business School, United Kingdom
Nitin Bakshi, Assistant Professor, London Business School, United Kingdom

We study the effect of intermediaries who compete to mediate between multiple competing retailers acting as leaders and multiple capacitated suppliers. We identify markets most advantageous for intermediaries, conditions under which retailers benefit from intermediation, and the effect of intermediaries on supply chain efficiency.

025-0009 Strategic Supplier Alliances under Default Risk
Tamer Boyaci, Associate Professor, McGill University, Canada
Mehmet Gumus, Assistant Professor, McGill University, Canada
Saibal Ray, Associate Professor, McGill University, Canada
Dan Zhang, Assistant Professor, University Of Colorado Boulder, United States
Xiao Huang, Assistant Professor, Concordia University, Canada

We study how suppliers form alliances in both assembly systems and competitive markets with default risks. Suppliers balance between joining larger alliances that have better chance to survive or smaller ones that result in higher profit allocations. Downstream assembler/buyer may invest in upstream risk structures and influence the coalition formation.

025-1417 Competition for Market and Supply under Asymmetric Information
Tolga Aydinliyim, Assistant Professor, University Of Oregon, United States
Zhibin Yang, Assistant Professor, University Of Oregon, United States

We study competition between two manufacturers selling into the same market. The manufacturers order a common component from a supplier with limited capacity, and subsequently make production decisions. Assuming the manufacturer with private demand information orders first, we characterize the manufacturers' equilibrium strategies and explore the impact of asymmetric information.

127	Saturday, 11:15 AM - 12:45 PM, Lincolnshire II (Floor 6)	<i>Track:</i> Empirical Research in OM
	<i>Session:</i> Empirical Research in OM I	
	<i>Chair(s):</i> Saravanan Kesavan	

025-0770 Implications of inventory turns for managing economic shocks
Vishal Gaur, Associate Professor, Cornell University, United States
Tarun Kushwaha, Assistant Professor, University Of North Carolina Chapel Hill, United States
Saravanan Kesavan, Assistant Professor, University Of North Carolina Chapel Hill, United States

In this paper we examine the implications of inventory turns in managing economic shocks. We find that high inventory turn retailers tend to purchase more than low inventory turn retailers following an expansion shock. We also find that excess inventory hurts low inventory turn retailers more.

025-0795 An Empirical Investigation on the Choices of Supply Chain and Operations Management Executives
Manpreet Hora, Assistant Professor, Georgia Institute Of Technology, United States
Vinod Singhal, Professor, Georgia Institute Of Technology, United States
Kevin Hendricks, Professor, Wilfrid Laurier University, Canada

Firms are changing the composition of their management team to include Supply Chain and Operations Management Executives (SCOMEs). We examine the stock market reaction to SCOME appointments and whether SCOME appointments are preceded by poor stock price performance. We identify factors that explain choice of an insider or outsider SCOME.

025-1532 Estimating Learning on Device Variants in Hip Replacement Surgery
Steven Stern, Professor, University Of Virginia, United States
Khaled Saleh, Professor, Southern Illinois University Carbondale, United States
Haiyan Liu, Student, University Of Virginia, United States
Kamalini Ramdas, Professor, London Business School, United Kingdom

We examine learning in the context of hip replacement surgery using a dataset from a major US hospital. We find that the learning associated with individual surgeons' experience is driven by their experience at the micro level of specific device variants, with implications for how surgery is managed and taught.

025-1385 Efficiency Analysis of U.S. and Indian Banks: Theory and Evidence
Sriram Venkataraman, Student, Clemson University, United States
Aleda Roth, Professor, Clemson University, United States
Paul Wilson, Professor, Clemson University, United States

Contrasting U.S. and Indian banks, we empirically investigate the influence of diffusion and path dependency theories in cross-cultural service strategy. We apply a consistent bootstrapping technique from data envelopment analysis literature and test the assumption of returns to scale, which is typically not captured in the extant operations management literature.

128	<p>Saturday, 11:15 AM - 12:45 PM, Ohio State (Floor 6) <i>Track:</i> Humanitarian Operations and Crisis Management</p> <p><i>Session:</i> Improving Humanitarian Operations in Practice</p> <p><i>Chair(s):</i> Paulo Goncalves</p>
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025-0671 Understanding the Drivers and Barriers of Coordination Among Humanitarian Organizations

Mohammad Moshtari, Student, University Of Lugano, Switzerland
 Paulo Goncalves, Associate Professor, University Of Lugano, Switzerland

This paper investigates the horizontal coordination among humanitarian organizations (HOs) during diverse phases of humanitarian operations. In particular, the study seeks to understand the drivers and barriers for horizontal coordination among HOs from both practitioners and academics sources and through theories extracted from the strategic management and operations management literatures.

025-1022 Humanitarian Response Transportation Planning: A Behavioral Study

Erica Gralla, Student, Massachusetts Institute Of Technology, United States
 Jarrod Goentzel, Lecturer, Massachusetts Institute Of Technology, United States
 Charles Fine, Professor, Massachusetts Institute Of Technology, United States

Humanitarian transportation planning is typically managed by people, who may understand the challenging context better than models. This paper investigates how people plan aid deliveries, observing teams of experienced humanitarian logisticians in a simulated emergency response. Using grounded theory and visual mapping, archetypal human decision processes are identified and evaluated.

025-0672 Improving WFP Ethiopia's Food Distribution through Supply Chain Redesign

Mekonnen Aberra, , World Food Programme, Ethiopia
 Paulo Goncalves, Associate Professor, University Of Lugano, Switzerland

Constrained truck capacity in the port of Djibouti limits WFP's ability to transport food to hubs and final destinations. Through supply chain redesign, we optimize the number of operating hubs while maintaining service allowing WFP Ethiopia to significantly increase frequency of trips and overall truck capacity.

025-1473 Sustainable Urban Sanitation: Simulating a Desludging Service in Senegal

Jennifer Green, Research Scientist, Massachusetts Institute Of Technology, United States
 Olivier de Weck, Associate Professor, Massachusetts Institute Of Technology, United States
 Pablo Suarez, Lecturer, Boston University, United States

Slow-onset climate-related emergencies such as urban flooding are a growing threat worldwide. This paper presents a recovery-phase project designed to reduce the impact of future flooding on the vulnerable population in Pikine, Senegal. Monte-Carlo analysis was used to evaluate the economic sustainability of a proposed public-private waste transportation service.

129	<p>Saturday, 11:15 AM - 12:45 PM, Purdue (Floor 6) <i>Track:</i> Marketing and OM Interface</p> <p><i>Session:</i> Strategic Consumer Behavior and Marketing Strategies</p> <p><i>Chair(s):</i> Xuying Zhao</p>
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025-0100 Profiting from Demand Uncertainty: Pricing Strategies in Advance Selling

Pang Zhan, Assistant Professor, Lancaster University, United Kingdom
 Xuying Zhao, Assistant Professor, University Of Notre Dame, United States

Is demand uncertainty a devil? A conventional thought is that demand uncertainty hurts a seller's profit. However, we show that demand uncertainty could favor a seller if the pricing mechanism is designed properly. Specifically, we study dynamic pricing, price commitment, and preorder price guarantee in advance selling.

025-0329 Price Matching or Simultaneous Negotiation? A Selection Dilemma

Weixin Shang, Assistant Professor, Fudan University, China
 Gangshu Cai, Associate Professor, Kansas State University, United States

This paper investigates two different negotiation mechanisms, price matching negotiation and simultaneous negotiation. We show firms encounter a selection dilemma in choosing a specific negotiation mechanism for the whole industry. Nevertheless, the firms can be coordinated so either negotiation mechanism can be mutually beneficial to all firms.

025-0110 How to Respond to a Focus Strategy Entrant: Proliferate, Invest or Ignore?

Muge Yayla-Kullu, Assistant Professor, Rensselaer Polytechnic Institute, United States
 Jayashankar Swaminathan, Professor, University Of North Carolina Chapel Hill, United States

We investigate the conditions where a market leader may respond to a focus strategy entrant by using different strategies such as changing the product mix, production volumes, quality levels of products, and by investing in more capacity. We find that complex relationships among these strategies may result in nontrivial outcomes.

025-0236 Opaque Distribution Channels for Competing Service Providers: Posted Price vs. Name-Your-Own-Price Mechanisms

Esther Gal-Or, Professor, University Of Pittsburg, United States
 Paolo Roma, Assistant Professor, Universita Degli Studi Di Palermo, Italy
 Rachel Chen, Associate Professor, University Of California Davis, United States

We study the impact of different selling mechanisms of an opaque reseller on competing travel service providers, who face both leisure and business customers. We find that with a single reseller, competing service providers prefer that this reseller uses the posted price instead of the Name-Your-Own-Price mechanism.

025-1675 Advance Selling with Strategic Consumers: A Supply Chain Perspective

Pang Zhan, Assistant Professor, Lancaster University, United Kingdom
 Kathryn Steckle, Professor, University Of Texas Dallas, United States
 Xuying Zhao, Assistant Professor, University Of Notre Dame, United States

We study whether or not a supplier should encourage a retailer to sell in advance. We find that pre-order demand uncertainty play an important role in a supplier's decision making.

130	Saturday, 11:15 AM - 12:45 PM, Great America II (Floor 6) <i>Track:</i> OM Practice <i>Session:</i> Practice-Based Research in Retail Operations <i>Chair(s):</i> Vishal Gaur
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025-0930 Demand Estimation with Stockouts and Substitution at the Cornell Store
 Suresh Muthulingam, Assistant Professor, Cornell University, United States
 Joonkyum Lee, Student, Cornell University, United States
 Vishal Gaur, Associate Professor, Cornell University, United States

We investigate the effect of stockouts on the accuracy and efficiency of demand estimation in the presence of substitution. Our study uses data for the sales of new and used textbooks from the Cornell Store to benchmark alternative methods. We apply our findings to the bookstore.

025-1087 Coordination of Inventory Distribution and Price Markdowns at Zara
 Felipe Caro, Assistant Professor, University Of California Los Angeles, United States

One of Zara's biggest challenges in preparation for the clearance season is determining how to distribute 11,000 different fashion designs to over 1,200 stores worldwide. We describe an ongoing project to distribute merchandise to stores with the highest potential of sale in order to maximize revenues during the clearance period.

025-1125 The Impact of Supplier Reliability Tracking on Customer Demand
 Nicole DeHoratius, Instructor, Zaragoza Logistics Center, United States
 Nathan Craig, Student, Harvard University, United States
 Ananth Raman, Professor, Harvard University, United States

To set service levels, firms must understand how changes in service affect demand. We provide a method for estimating the impact of supplier performance on customer demand. Using data from Hugo Boss we find increases in supplier reliability to be associated with significant increases in orders from Hugo Boss's customers.

025-1723 An Algorithm and Demand Estimation Procedure for Retail Assortment Optimization
 Ramnath Vaidyanathan, Assistant Professor, Mcgill University, Canada
 Marshall Fisher, Professor, University Of Pennsylvania, United States

We develop a methodology for estimating demand, optimizing assortments and localizing them across a chain of stores. We applied this approach for three real examples: snack cakes, tires and automotive appearance chemicals. A portion of our recommendations were implemented and produced sales increase of 3-6%.

131	Saturday, 11:15 AM - 12:45 PM, Dupage (Floor 3) <i>Track:</i> Scheduling and Logistics <i>Session:</i> Manpower Scheduling <i>Chair(s):</i> Janny Leung
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025-1737 The Demand Weighted Vehicle Routing Problem
 Kipp Martin, Professor, University Of Chicago, United States
 Jeff Camm, Professor, University Of Cincinnati, United States
 Changjoo Kim, Assistant Professor, University Of Cincinnati, United States
 Saravanan Kuppusamy, Student, University Of Cincinnati, United States
 Michael Magazine, Professor, University Of Cincinnati, United States

We consider the problem of constructing optimal bus routes for carrying students from residences to campus and then back home, where the vehicles carry people and each person travels the entire length of the route. The resulting model is a non-convex integer program that is extremely difficult to optimize.

025-1326 A serial scheme for resource-constrained scheduling within Microsoft Project 2010
 Philipp Baumann, Student, University Of Bern, Switzerland
 Gianluca Brandinu, Student, University Of Bern, Switzerland
 Norbert Trautmann, Professor, University Of Bern, Switzerland

Microsoft Project is one of the most-widely used software-packages for project management. We address the resource-constrained scheduling of single-item production projects. We present a novel schedule-generation scheme, which we have implemented in Microsoft Project as a bidirectional multi-pass heuristic. Our computational results show that this heuristic outperforms the built-in method.

025-1736 Scheduling of Multi-skilled Staff Across Multiple Locations
 Janny Leung, Professor, Chinese Univ Of Hong Kong, China
 Yong Hong Kuo, Student, Chinese Univ Of Hong Kong, Hong Kong
 Candi Yano, Professor, University Of California Berkeley, United States

Motivated by airport operations, we study a manpower scheduling problem with multi-skilled staff and multiple locations. The problem is challenging due to skills heterogeneity, logistical factors, work rules and travel times between locations. We present an integer programming formulation, and derive valid inequalities within our branch-and-cut procedure.

132	Saturday, 11:15 AM - 12:45 PM, Ballroom A (Floor 5) <i>Track:</i> Sustainable Operations <i>Session:</i> Supply Chains and Policy <i>Chair(s):</i> David Drake
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025-0505 Green Galápagos: A Closed Loop Supply Chain Perspective
 Eva Ponce, Associate Professor, Universidad Politécnica de Madrid, Spain

Ximena Cordova, Professor, Universidad San Francisco de Quito, Ecuador
 Edgar Blanco, Professor, Massachusetts Institute Of Technology, United States

The Galápagos Islands have experienced significant economic growth from tourism. Due to its geography and habitat protection regulations, all products and services are imported from Ecuador. We present an environmental assessment of the supply chains that flow into the Galápagos, highlighting their "closed-loop" nature. Strategies for environmental mitigation are proposed.

025-1024 Engaging Supply Chains in Climate Change

Michael Toffel, Associate Professor, Harvard University, United States
 Chonnikarn Jira, Student, Harvard University, United States

We theorize and empirically identify factors associated with suppliers being willing to share climate change information with buyers when buyers request this information. We primarily consider characteristics of demand for this information and suppliers' cost and vulnerabilities. We test our hypothesis using data from the Carbon Disclosure Project.

025-1512 Industry & Regulator: Two Perspectives on the Challenges of Carbon Regulation

David Drake, Assistant Professor, Harvard Business School, United States

We study the challenges faced by a carbon-regulated firm and the challenges faced by an organization implementing voluntary carbon regulation across its business units. The first study provides insights into the threats and levers faced by firms under emissions regulation, while the second explores the challenges of mechanism design.

133	Saturday, 11:15 AM - 12:45 PM, Denver (Floor 5)	<i>Track:</i> Sustainable Operations
	<i>Session:</i> Supply Chain Perspectives	
	<i>Chair(s):</i> Andre Carvalho	

025-0390 Development of Closed-Loop Supply Chain Model between Japan and South-East Asian Countries

Yasutaka Kainuma, Associate Professor, Tokyo Metropolitan University, Japan

We develop a Closed-Loop Supply Chain model that is applied to two countries. In this model we consider corporation tax of each country. The Objective function is the sum of net income after taxes of two corporations of both countries. We could verify the efficiency of the proposed model.

025-0969 Redesigning supply networks to produce sustainable and fashionable footwear

Rosanna Fornasiero, Researcher, ITIA-CNR, Italy
 Valentina Franchini, Student, Padova University, Italy
 Andrea Vinelli, Professor, Universita Di Padova, Italy

Based on case study research, the paper compares fashion and orthopaedic footwear best practices to develop an innovative reference model that supports fashion footwear supply networks to meet the needs of specific consumers (such as elderly, obese, disabled, or diabetic persons), by producing small series of sustainable and fashionable footwear.

025-1594 Induction of sustainability on supply chains: case study of a Brazilian cosmetics company

Andre Carvalho, Assistant Professor, FGV-EAESP / Center for Sustainability Studies (GVces), Brazil
 Jose Barbieri, Associate Professor, FGV-EAESP, Brazil

The objective of this study is to identify how focal companies induce social and environmental practices across supply chains. Based on literature review and also from a case study of a Brazilian cosmetics focal company, evidences of the need of formal mechanisms of cooperation between supply chain members are presented.

025-1503 Competition among Food, Energy and Environment: Sustainable Biofuel Supply Chain Design

Yanfeng Ouyang, Associate Professor, University Of Illinois Urbana-Champaign, United States
 Xin Wang, Student, University Of Illinois Urbana-Champaign, United States
 Michael Lim, Assistant Professor, University Of Illinois Urbana-Champaign, United States

Some attributes the recent significant raise in food price to rapid expansion of biofuel industry. We propose a continuous biofuel supply chain model to (i) capture the impact of biofuel production on the food market and environment; and (ii) draw managerial insights for the biofuel firms as well as the government.

025-1475 Sustainability on Soy and Beef Supply Chains: Case Studies Focused on the Brazilian Amazon

Paula Adaime, Student, Center for Sustainability Studies (GVces), Brazil
 Marta Braconi, Consultant, Pricewaterhousecoopers, Brazil
 Andre Carvalho, Assistant Professor, FGV-EAESP / Center for Sustainability Studies (GVces), Brazil
 Mario Monzoni Neto, Assistant Professor, FGV-EAESP / Center for Sustainability Studies (GVces), Brazil

This study analyses sustainability practices on soy and beef supply chains through two case studies focused on the Brazilian Amazon. Both industries are expanding at unrestrained rate into this region. This work shows evidence that several civil society initiatives, although incipient, have positively influenced the sustainability agenda of focal companies.

134	Saturday, 11:15 AM - 12:45 PM, Ballroom H (Floor 5)	<i>Track:</i> Teaching in OM
	<i>Session:</i> Teaching Operations Management to Business Undergraduate Students	
	<i>Chair(s):</i> F. Jacobs	

025-0858 A Framework and Set of Cases for Teaching Supply Chain Analytics

F. Jacobs, Professor, Indiana University Bloomington, United States

In this session we describe a new framework related to teaching using an analytics foundation as compared to a problem solving or case approach. We also describe a new set of 10 supply chain analytics cases that have recently been developed for use in the classroom.

025-0884 Supply Chain Analytics: Curriculum and a Case Competition

Rhonda Lummus, Professor, Indiana University, United States

Supply chain analytics involves the use of real data and mathematical decision tools to identify trends and understand decision alternatives. This session will define supply chain analytics and discuss how it can be incorporated in the curriculum. An innovative case competition based on supply chain analytics will be described.

135	Saturday, 11:15 AM - 12:45 PM, Illinois (IL) (Floor 6) <i>Session:</i> Optimizing Manufacturing & Supply Operations <i>Chair(s):</i> Shihua Ma	<i>Track:</i> Manufacturing Operations
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025-0227 Optimal decisions for a decentralized assembly system with dual supply modes

Shihua Ma, Professor, Huazhong University Of Science & Technology, China
 Danfeng Ying, Student, Huazhong University Of Science & Technology, China
 Xu Guan, Student, Huazhong University Of Science & Technology, China

We consider a decentralized assembly system with one assembler and two suppliers, where one supplier is perfectly reliable and another generates yield uncertainty. With customer's random demand, we derive each component's optimal production quantity through a static Nash game model. Finally, we propose a contract to achieve supply chain coordination.

025-0842 Optimal Shutdown Schedule of Heat Treatment Furnace: A Case

Pratap Mohapatra, Professor, Indian Institute Of Technology Kharagpur, India

The heat-treatment furnace in a bearings manufacturing plant has a 25 % overcapacity and is shut down, based on managers' judgment, to save energy. The optimal shutdown schedule is derived here by minimizing the combined energy and heat-treated inventory holding cost while ensuring that the inventory satisfies the downstream demand.

025-0430 A failure-prone system with delivery deadline and outsourced maintenance

Shailesh Kulkarni, Associate Professor, University Of North Texas, United States
 Hakan Tarakci, Assistant Professor, University Of North Texas, United States
 Sharafali Moosa, Associate Professor, Singapore Management University, Singapore

A supplier needs to produce a pre-determined number of items by a due date. The actual production time is uncertain due to random failures. A contractor is hired to provide maintenance services. Supplier's optimal decision for production time allowance and contractor's optimal decision for preventive maintenance schedule are explored.

136	Saturday, 11:15 AM - 12:45 PM, Ballroom B (Floor 5) <i>Session:</i> Retail Supply Chains <i>Chair(s):</i> Almula Camdereli Muge Yayla-Kullu	<i>Track:</i> Supply Chain Management
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025-0590 Supply Information Sharing in a One Warehouse, Multiple Retailers Supply Chain

Apurva Jain, Associate Professor, University Of Washington, United States

In a supply chain with one supplier and multiple retailers, some retailers have access to information about the supplier's inventory level. We analyze the dynamics of such a supply chain and determine the optimal policy for each party. We also study the impact on each party of supply information sharing.

025-0889 Wine Futures and Advance Selling under Quality Uncertainty

Burak Kazaz, Associate Professor, Syracuse University, United States
 Scott Webster, Professor, Syracuse University, United States
 Tim Noparumpa, Student, Syracuse University, United States

We examine the use of wine futures as a tool for managing quality-rating uncertainty in wine production. Wine futures enable the firm to pass on the risk of holding inventory that is uncertain in value to the consumers, while allowing the firm to recuperate the investment early in the production.

025-1441 The effect of online streaming on subscription-based video rental services

Victor Jose, Assistant Professor, Georgetown University, United States
 Almula Camdereli, Assistant Professor, Georgetown University, United States

There is a recent debate among practitioners about whether live streaming will be the future of the video rental industry. Using a heterogeneous customer base, we study the optimum bucket pricing strategy and analyze the effects of online media coverage on the pricing policy.

025-0193 Consignment or Wholesale: Retailer and Supplier Preferences and Incentives for Compromise

Renato de Matta, Associate Professor, University Of Iowa, United States
 Timothy Lowe, Professor, University Of Iowa, United States
 Dengfeng Zhang, Lecturer, Lingnan Univ, Hong Kong

We consider a retailer and a supplier that have an interest in reaching an agreement, but their choices of contract type are not entirely identical. We study how changes in market settings, price markups and cost shares can affect the retailer and supplier profits and contract preferences.

025-0738 Are Strategic Customers Bad for a Supply Chain?

Yen-Ting Lin, Assistant Professor, University Of San Diego, United States
 Ali Parlakturk, Assistant Professor, University Of North Carolina Chapel Hill, United States
 Jayashankar Swaminathan, Professor, University Of North Carolina Chapel Hill, United States

We examine the impact of having strategic customers on the performance of a two-tier supply chain. We find that having strategic customers can increase firm profitability as well as the total supply chain profit.

137	Saturday, 11:15 AM - 12:45 PM, Houston (Floor 5) <i>Session:</i> Supply Chain Collaboration <i>Chair(s):</i> Ricardo Cassel	<i>Track:</i> Supply Chain Management
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025-0906 Collaborative Application of a Continuous Improvement Tool in a Supply Chain

Jose Mayer, Student, University Of Vale Dos Sinos - Unisinos, Brazil
Ricardo Cassel, Associate Professor, UNISINOS, Brazil

Collaborative relationship between companies in a supply chain enables the improvement of performance and results. This paper presents a collaborative methodology for applying a continuous improvement tool between the focal company and its supplier. The results after the collaborative methodology application brought benefits to the companies and the supply chain.

025-1448 Real-Time versus Batch Order Management Policies in an Integrated Supply Chain

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

There has been a growing trend in Manufacturing Execution Systems (MES) to include real time management features for order management. Researchers have suggested the use of batch policies to maximize profits. We utilize commercially available software to compare real-time order management with traditional batch order management policies.

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025-0791 Coordination in two-echelon close-loop supply chain

Cong Jiang, Student, Hong Kong University Of Science & Tech, Hong Kong

In this paper, we discussed two-echelon close-loop supply chain with one manufacturer and two retailers via different reverse channel. There exists market cannibalization in forward logistics and competition in reverse logistics. This paper established contracts to coordinate the close-loop supply chain.

025-0786 Managing a supply chain with Joint Replenishment, Channel Coordination, Deteriorating items, Exponential demand

Ramasubramaniam Muthurathnasabapathy, Assistant Professor, Loyola Institute of Business Administration, India
Chandiran Palaniappan, Associate Professor, Loyola Institute of Business Administration, India

This paper addresses a new research problem: managing a two-echelon supply chain with multiple deteriorating products and exponentially decaying demand. This problem extends the research problem addressed by Chen&Chen (2005) in which demand of the goods were assumed to follow a linear function. New exact solutions and their properties studied.

138	Saturday, 11:15 AM - 12:45 PM, Watertower (Floor 10) <i>Track:</i> OM in Travel, Tourism, and Hospitality Industries <i>Session:</i> Managing the Service Experience in Travel, Tourism and Hospitality <i>Chair(s):</i> Jay Kandampully
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025-0483 Panel Discussion on Managing the Service Experience in Travel, Tourism and Hospitality

Jay Kandampully, Professor, Ohio State University, United States
Chris Roberts, Professor, Depaul University, United States
Linda Shea, Professor, University Of Massachusetts Amherst, United States
Michael Collins, Associate Professor, Coastal Carolina University, United States

This panel session will discuss strategies for how to best manage the customer experience for travel, tourism, and hospitality services. The concept of 'experience' proposes the notion of value enhancement to the firm's offering. Panelists will provide insights about how to deliver memorable and positive customer experiences.

139	Saturday, 11:15 AM - 12:45 PM, Ballroom F (Floor 5) <i>Track:</i> Product Innovation and Technology Management <i>Session:</i> Behavioral Influences on Product Design <i>Chair(s):</i> Onesun Yoo
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025-0576 A Model of Product Specification Bargaining and Project Abandonment

Christoph Loch, Professor, Cambridge Judge School of Business, United Kingdom
Zhijian Cui, Assistant Professor, IE Business School, Spain

This paper examines how the interaction process between two representative functions with differing goals can be modified in order to reduce the possibility of wasteful conflicts. We specifically examine three levers: signaling of preference by the function with less power, a bonus to the more powerful party, and introducing status.

025-1290 Resource allocation strategies when perception matters

Onesun Yoo, Assistant Professor, University College London, United Kingdom
Bilal Gokpinar, Assistant Professor, University College London, United Kingdom

This research focuses on buyer-provider relationships when certain buyers' decisions are influenced by their perception of other buyers' behaviors. Considering "perception" as a key factor behind purchasing decisions of the buyers, we develop a model to identify and examine optimal resource allocation strategies for the provider.

025-1606 Scenario-Based Experiments in Team-Based Environments

Vicki Smith-Daniels, Professor, Indiana University, United States

Dwight Smith-Daniels, Professor, Wright State University, United States

We present an approach for developing and utilizing scenario-based role-playing experiments for the purpose of understanding how and why project managers develop preference and biases and make decisions. The scenario-based experiment provides the opportunity to convey scripted information about specific levels of factors of interest regarding the project environment.

140	Saturday, 11:15 AM - 12:45 PM, Los Angeles (Floor 5) <i>Session:</i> Product Architecture and Innovation <i>Chair(s):</i> Tyson Browning	<i>Track:</i> Product Innovation and Technology Management
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025-0657 Strategic Linkages of Product Architecture Decisions: Organizational and Performance Implications

Ujjal Mukherjee, Student, University Of Minnesota, United States

What are the strategic linkages to product architecture decisions and what are the organizational and performance implications thereof? In this paper we invoke several theoretical lenses to analyze the above question in details and propose a product architecture decision framework.

025-0911 Orchestrating Innovation: Reducing downside effects of architectural mismatches in complex product development

Sebastian Fixson, Assistant Professor, Babson College, United States
 Ben Dawson, Student, Massachusetts Institute Of Technology, United States
 Daniel Whitney, Retired, Massachusetts Institute Of Technology, United States

Mismatches between product architecture and organizational architecture can present serious challenges for achieving high product development performance. In this paper we test a set of variables via simulation and experiments to see whether and how they might mitigate the detrimental mismatch effects in the context of a complex innovation project.

025-0072 Design Structure Matrix (DSM) Methods and Applications

Tyson Browning, Associate Professor, Texas Christian University, United States

The design structure matrix (DSM) is a powerful tool for visualizing, analyzing, innovating, and improving systems, including product architectures, organizational structures, and process flows. This tutorial demonstrates these three types of DSM applications with industry examples. Attendees will learn how to build and apply DSMs in their research or practice.

141	Saturday, 11:15 AM - 12:45 PM, Northwestern (Floor 6) <i>Session:</i> Sourcing and Supply Chain Management <i>Chair(s):</i> Cuihong Li	<i>Track:</i> Product Management
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025-0958 Teamwork, Projects and Optimal Termination

George Georgiadis, Student, University Of California Los Angeles, United States
 Christopher Tang, Professor, University Of California Los Angeles, United States
 Steven Lippman, Professor, University Of California Los Angeles, United States

We study how the collaboration of a team on a project evolves until the manager decides to terminate it, and collect the reward associated with the progress accomplished. We focus on how the team size and the manager's ability to commit to a termination state affect the optimal termination state.

025-1078 Sourcing for Quality: Pricing, Inspection, and Cooperation

Cuihong Li, Assistant Professor, University Of Connecticut Storrs, United States
 Hsiao-hui Lee, Assistant Professor, University of Hong Kong, China

A buyer can provide price incentive for the supplier to exert quality improvement effort, use inspection to screen out nonconforming products, or spend her own resource on cooperating with the supplier to improve the product quality. We investigate the use of the three instruments in quality management.

025-1098 Contract Design for Collaborative New Product Development

Nektarios Oraopoulos, Assistant Professor, Cambridge University, United Kingdom
 Vishal Agrawal, Assistant Professor, Georgetown University, United States

Extant literature has focused on formal contracting mechanisms to align incentives between supply-chain partners. However, such mechanisms are difficult to implement due to the difficulty in outlining all possible contingencies. We analyze the role of simple ex-ante contracts and decision rights in the context of collaborative new product development.

025-1727 Quality audit and supplier inspection in multi-level supply chains

Yan Dong, Assistant Professor, University Of Maryland, United States
 Xiang Wan, Assistant Professor, Marquette University, United States
 Kefeng Xu, Associate Professor, University Of Texas San Antonio, United States
 Yi Xu, Assistant Professor, University Of Maryland, United States

This paper studies a brand owner's optimal choice between two major quality control programs, supplier inspection and quality audit, in multi-level supply chains. We find that the brand owner's optimal choice of quality control program in the multi-level supply chain can be different from that in a dyadic supply chain.

142	Saturday, 11:15 AM - 12:45 PM, Ballroom C (Floor 5) <i>Session:</i> Decision Support Tool Applications at Mayo Clinic <i>Chair(s):</i> Thomas Rohleder	<i>Track:</i> Healthcare Operations
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025-0186 Overbooking model of neurology consultation appointment data to improve patient access.

Todd Huschka, Masters Health Services Analyst, Mayo Clinic, United States
 Thomas Rohleder, Professor of Healthcare Systems Engineering, Mayo Clinic, United States
 James Moriarty, Masters Health Services Analyst, Mayo Clinic, United States

Appointment scheduling for physician consultations is an important aspect of the outpatient practice. Schedule changes through cancelations, reschedules, and no-shows can result in sub-optimal resource utilization. We construct a simulation model using Markov state transitions to better understand appointment patterns and to improve scheduling practices with introducing an overbooking policy.

025-0386 Maintaining High Service Level with Fewer Cardiovascular Recovery Beds: Optimal Surgery Mixture Scheduling

Yariv Marmor, Research Associate - Health Care Policy and Research, Mayo Clinic, United States
 Thomas Rohleder, Professor of Healthcare Systems Engineering, Mayo Clinic, United States
 Todd Huschka, Masters Health Services Analyst, Mayo Clinic, United States
 David Cook, Professor of Anesthesiology, College of Medicine, Mayo Clinic, United States
 Jeffrey Thompson, Senior Health Systems Engineering Analyst, Clinical Practice Unit, Mayo Clinic, United States

High surgical variability and limited weekend usage within a Cardiovascular Surgical unit create a ripple effect throughout the week that affects the number of recovery beds needed. We examine an optimal surgical mix that account for patients' length of stay and flow. We used simulation to validate the findings.

025-0420 Modeling the Effect of Shorter Shelf Life of Red Blood Cells on Blood Supplies

Thomas Rohleder, Professor of Healthcare Systems Engineering, Mayo Clinic, United States
 Scott Hammel, NA, Mayo Clinic, United States
 James Stubbs, NA, Mayo Clinic, United States
 Gina Dumkrieger, Student, Arizona State University Tempe, United States

Evidence exists that patients that receive freshly donated blood have better medical outcomes. However, due to available blood supplies this may not always be medically possible or financially feasible. We use a simulation model to examine the effect of reducing the age of blood at transfusion.

025-1396 Forecasting Internal Referral Appointment Demand to Improve Outpatient Capacity Planning at Mayo Clinic

Thomas Rohleder, Professor of Healthcare Systems Engineering, Mayo Clinic, United States

We report on the development of a forecast of future appointment demands for medical specialties. The forecast provides Mayo Clinic decision makers with valuable information needed to better manage capacity. The forecast helps avoid having too many or too few appointment slots available.

143	Saturday, 11:15 AM - 12:45 PM, Kansas City (Floor 5)	<i>Track:</i> Healthcare Operations
	<i>Session:</i> Healthcare Case Studies	
	<i>Chair(s):</i> Philip Kazemsky	

025-1097 Social responsibility and procedures on return to work of employees on leave due to illness and accidents

João Camarotto, Professor, Universidade Federal De São Carlos, Brazil
 Manoela Lahoz, Student, Universidade Federal De São Carlos, Brazil

Case studies in Brazilian company in the business of vehicular equipments. The research proposes a model to reintegrate employees on leave due to illness or work-related injuries using concepts of ergonomic analysis of activity and procedures based on functional reintegration.

025-1203 Innovation Management Framework in the Group of Thailand's Private Hospital: Case Study

Pakpachong Vadhanasindhu, Associate Professor, Technopreneurship and Innovation Management, Graduate School, Chulalongkorn, Thailand
 Laphasrada Changkaew, Student, Technopreneurship and Innovation Management, Graduate school, Chulalongkorn, Thailand
 Kusuma Pasanake, Student, Technopreneurship and Innovation Management, Graduate School, Chulalongkorn, Thailand
 Achara Chandrachai, Emeritus Professor, Technopreneurship and Innovation Management, Graduate School, Chulalongkorn, Thailand

Innovation management is new paradigm in Thailand. The objective of this study is to explore innovation management in private hospital and propose innovation management framework. We applied British standard: BS7000 to analyze managing innovation. Continuous innovation loop and lean process are necessary in innovation management framework for sustainable hospital.

025-1309 Sustainable of hospital service innovation under Sufficiency economy philosophy in Thailand

Achara Chandrachai, Emeritus Professor, Technopreneurship and Innovation Management, Graduate School, Chulalongkorn, Thailand
 Pakpachong Vadhanasindhu, Associate Professor, Technopreneurship and Innovation Management, Graduate School, Chulalongkorn, Thailand
 Damrong Thawesaengkulthai, Associate Professor, Carleton University, Thailand
 Laphasrada Changkaew, Student, Technopreneurship and Innovation Management, Graduate school, Chulalongkorn, Thailand

This study analyzes hospital services innovation project in Thailand under sufficiency economy philosophy in two condition; knowledge and morality, three characteristics, moderation, reasonableness and self immunity. Technology innovation in services in sufficiency economy can be commercialize, reduce cost of care and improve new service or process for stable and sustainable

025-1397 From the Classroom to the Medical Office: Operational Planning and Scheduling

Philip Kazemsky, Professor, University Of Tennessee Chattanooga, United States

Industrial capstone projects are selected and undertaken which provide the students a culminating experience in an on-site environment. The project encompasses researching, evolving technical solutions, and eventual testing of results. Empirical, quantitative and simulation approaches are evolved for testing and evaluation of applicability for improving operations, utilization of resources/facilities/ personnel.

144	Saturday, 11:15 AM - 12:45 PM, Wisconsin (WI) (Floor 6)	<i>Track:</i> Retail Operations
	<i>Session:</i> Retail Operations IV	
	<i>Chair(s):</i> Denis Saure	

025-0651 Assortment Competition under Multinomial Logit Demand

Omar Besbes, Assistant Professor, Columbia University, United States
 Denis Saure, Assistant Professor, University Of Pittsburg, United States

We study equilibrium behavior for assortment competition when consumers examine all retailers' offerings before making purchase decisions. We study a setting where retailers' offerings may overlap. We analyze equilibrium properties in a variety of settings and analyze the implications of common products on competitive behavior and equilibrium structure.

025-1095 Consumer Subsidies and Industry Response Dynamics Under Multi-period Stochastic Demand

Georgia Perakis, Professor, Massachusetts Institute Of Technology, United States
 Maxime Cohen, Student, Massachusetts Institute Of Technology, United States
 Ruben Lobel, Assistant Professor, The Wharton School, University of Pennsylvania, United States

Governments use consumer incentives to promote new technologies and stimulate investments from the private sector (eg. solar panels). We model the interaction between government and industry players in a multi-period setting under uncertain demand. We show how the market structure and timing will affect the outcome of the technological development.

025-1692 Retail Demand Estimation: Complements to Negative Binomial Distribution and Out-of-Sample Likelihood

Rogelio Oliva, Associate Professor, Texas A&M University College Station, United States
 Howard Hao-Chun Chuang, Student, Texas A&M University College Station, United States

Negative binomial distribution has been shown to characterize retail demand well because it tackles over-dispersion that Poisson distribution fails to capture. We propose two alternative models to accommodate under-dispersion, skewness, and fat tails. Moreover, we employ a metric well grounded on information theory to perform model estimation, selection, and extrapolation.

025-1533 Retail Space Optimization as a Tool in the Category Management Toolkit

Andrew Vakhutinsky, Principal Senior Scientist, Oracle, United States
 Kresimir Mihic, researcher, Oracle, United States
 David Vengerov, researcher, Oracle, United States

We formulate Retail Space Optimization problem as maximization of revenue or any other key performance indicator subject to space constraints and business rules. We describe how the problem is connected to replenishment and assortment optimization tools and compare various solution approaches using historic sales data from large retail chains.

145	Saturday, 11:15 AM - 12:45 PM, River North (Floor 2) <i>Session:</i> Supply Chain Coordination <i>Chair(s):</i> Tharanga Rajapakshe	<i>Track:</i> Vendor and Supply Contracts
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025-1186 Efficient Distribution of Water Between Head-Reach and Tail-End Farms in Developing Countries

Milind Dawande, Professor, University Of Texas Dallas, United States
 Srinagesh Gavirneni, Associate Professor, Cornell University, United States
 Vijay Mookerjee, , University Of Texas Dallas, United States
 Mili Mehrotra, Assistant Professor, University Of Minnesota, United States

In developing countries, inequity in surface water distribution to farms arises due to their relative physical locations: water for tail-end farms must pass via their head-reach counterparts. We propose two decentralized coordination schemes: rate-card and water-guarantee for efficient distribution.

025-1420 Improving the Milk Supply Chain in Developing Countries: Analysis, Insights, and Recommendations

Milind Dawande, Professor, University Of Texas Dallas, United States
 Vijay Mookerjee, , University Of Texas Dallas, United States
 Ramaswamy Chandrasekaran, Professor, University Of Texas Dallas, United States
 Liyang Mu, Student, University Of Texas Dallas, United States

Milk adulteration has been widely reported across developing countries. We identify the root causes of poor milk quality in the current supply chain, examine the impact of penalty, self-declaration, confessor rewards, quality rewards on the equilibrium quality, and design a test policy to completely eliminate the quality problems.

025-1612 Environmental Implications for Online Retailing

Janice Carrillo, Associate Professor, University Of Florida, United States
 Asoo Vakharia, Professor, UF, United States
 Ruoxuan Wang, Student, University Of Florida, United States

Recent press has highlighted the environmental benefits associated with online shopping. We formulate a dual channel model for a retailer who has access to both online and traditional market outlets to analyze the impact of customer environmental sensitivity on its supply.

025-1072 The impact of the manufacturer-hired sales-agent on a supply chain with information asymmetry

Neda Ebrahim-Khanjari, Student, Northwestern University, United States
 Seyed Iravani, Professor, Northwestern University, United States
 Hyoduk Shin, Assistant Professor, Northwestern University, United States

We consider a supply chain consisting of a retailer, and a manufacturer who hires a sales-agent to increase the demand. We show that the improved accuracy of the retailer's forecast can hurt himself. Moreover, we also demonstrate that more efficient sales-agent is not always beneficial for the retailer.

146	Saturday, 11:15 AM - 12:45 PM, Cook (Floor 3) <i>Session:</i> Hedging and Financing in Supply Chain <i>Chair(s):</i> Xiaole Wu	<i>Track:</i> Supply Chain Risk
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025-0401 Integrated Supply Chain Risk Management via Operational and Financial Hedging

Dia Bandaly, Student, Concordia University, Canada
 Ahmet Satir, Professor, Concordia University, Canada
 Latha Shanker, Professor, Concordia University, Canada

We develop an integrated model to manage risks in a supply chain in the beer industry. Exposed to commodity price fluctuations and demand uncertainty, operational and financial hedging decisions are made simultaneously to minimize the supply chain opportunity cost. We study the impact of three factors on the model performance.

025-0802 Integration of Production and Financial Hedging Decisions in Global Markets with Value-at-Risk Consideration

Yuan Wen, Student, Tsinghua University, China
 Qing Ding, Assistant Professor, Singapore Management University, Singapore
 Jian Chen, Professor, Tsinghua University, China

A firm makes capacity and financial hedging decisions in an international distribution networks. The objective is to maximize the expected profit subject to a Value-at-Risk constraint. Our joint optimal policy increases the firm's expected profit, balances the budget limitation and coordinates the risks with a range of exchange rates.

025-1243 Value of Operational Flexibility in Uncertain Supply and Demand Environments with Oil Refining Applications

Lingxiu Dong, Associate Professor, Washington University St Louis, United States
 Panos Kouvelis, Professor, Washington University St Louis, United States
 Xiaole Wu, Assistant Professor, Fudan University, China

Refining is indispensable to almost every natural resource and agricultural commodity based industry. We investigate the interconnection among input procurement, intermediate processing, and output blending decisions in the refining process. We offer insights on how the market conditions affect the value of conversion flexibility and its interaction with range flexibility.

147	Saturday, 11:15 AM - 12:45 PM, Ballroom G (Floor 5)	<i>Track:</i> Service Operations
	<i>Session:</i> Improving Customer Service Interactions	
	<i>Chair(s):</i> Ryan Buell	

025-0687 The Impact of Customer Heterogeneity on Service Outcomes

Dennis Campbell, Associate Professor, Harvard University, United States
 Frances Frei, Professor, Harvard University, United States
 Ryan Buell, Student, Harvard University, United States

We decompose the variance of 58,294 face-to-face retail banking transactions, quantifying the relative importance of customer, employee, process, location and market-level effects on satisfaction outcomes. Customer-level differences account for most of the explained aggregate variance, demonstrate that customer compatibility with the operating model is a primary determinant of service outcomes.

025-0756 Is Tom Cruise Threatened? An Empirical Study of the Impact of Product Variety on Demand Concentration

Serguei Netessine, Emeritus Professor, INSEAD, France
 Lorin Hitt, Professor, University Of Pennsylvania, United States
 Tom F. Tan, Student, University Of Pennsylvania, United States

We empirically examine the impact of expanded product variety due to the adoption of the Internet on demand concentration. We analyze two large data sets from the movie rental industry at both movie-level and consumer-level. We find that product variety increases demand for hits but reduces demand for niches.

025-1393 Congestion: The Hidden Cost of Price Increases in Gasoline Retail

Margaret Pierson, Retired, Harvard Business School, United States

In gasoline retail, per-transaction purchase volume often decreases as prices increase although aggregate demand is relatively stable. Thus, transaction counts and service station congestion can increase with price reducing convenience store conversions. Using transactional panel data, this study investigates the relationship between prices and service level.

025-1407 Consumer learning and firm profitability in service industries

Tina Tang, Student, Harvard business school, United States
 Ryan Buell, Student, Harvard University, United States

We study the variation of consumer response to price and service shocks across a sample of retail banking markets. We isolate the effects of variables such as social network structure, connectedness, and geographic fragmentation on rates of consumer learning of both negative and positive shocks to product and service.

148	Saturday, 11:15 AM - 12:45 PM, Miami (Floor 5)	<i>Track:</i> OM and Economic Models
	<i>Session:</i> Non-monetary Trade and Environmental Economics	
	<i>Chair(s):</i> Krishnan Anand Kris Johnson	

025-1062 Analyzing Scrip Systems: Selection Rules and Optimality

David Simchi-Levi, Professor, Massachusetts Institute Of Technology, United States
 Kris Johnson, Student, Massachusetts Institute Of Technology, United States
 Peng Sun, Associate Professor, Duke University Durham, United States

We model a scrip system (non-monetary trade economy) as a stochastic game and study selection rules to match potential trade partners over time. We show the optimality of one particular rule in terms of maximizing social welfare, while satisfying individual rationality constraints, and characterize under what conditions economic crashes occur.

025-1557 A Voting-based Mechanism for Setting Service Expectations in Air Traffic Flow Management (ATFM)

Prem Swaroop, Student, University Of Maryland, United States
 Michael Ball, Professor, University Of Maryland, United States

The Service Expectations Problem in ATFM seeks to determine a multi-criteria Traffic Management Initiative (TMI) design vector that represents a consensus across multiple airlines. We devise an iterative voting-based mechanism, whereby an optimization model is solved at each iteration to generate new design vectors considered in the subsequent voting round.

025-1636 Pollution Regulation and Production

Francois Giraud-Carrier, Student, University Of Utah, United States
 Krishnan Anand, Associate Professor, University Of Utah, United States

We develop an analytical model to study the relationship between pollution regulation and production. To comply with regulations, firms have several levers, including pollution abatement and output reduction. We study the impact of various pollution control mechanisms including Emissions Taxes and Cap-and-Trade on pollution abatement, production, consumer surplus and welfare.

025-0891 Pollution and Production

Krishnan Anand, Associate Professor, University Of Utah, United States
 Francois Giraud-Carrier, Student, University Of Utah, United States

Firms resist pollution regulation arguing that it causes production costs to rise, leading to higher prices, reduced output, and layoffs. We model the tradeoff between pollution regulation and economic growth under different mechanisms. Does pollution regulation inevitably lead to output reduction? Which mechanisms are optimal for firms, consumers, and society?

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Saturday, 11:15 AM - 12:45 PM, Minnesota (MN) (Floor 6) *Track:* Inventory Management
Session: Dynamic Approach to Inventory Management Problems
Chair(s): Arnab Bisi

025-0204 Optimizing Dynamic Production, Transshipment and Pricing Management of Two Manufacturing Facilities

Jianjun Xu, Postdoc , Zaragoza Logistics Center, Spain
 Youyi Feng, Professor, Zaragoza Logistics Center, Spain

We study the optimal production/inventory and transshipment policy of a finite horizon, periodic review inventory/production system of two manufacturing facilities that replenishes the same product to fulfill respective stochastic demands. The efficient optimal ordering, substitution and pricing decisions and their relationships with inventory levels are characterized.

025-0081 On (r,Q) Policies in Continuous Review Inventory Systems with Remanufacturing and Setup Costs

S. Viswanathan, Professor, Nanyang Technological University, Singapore
 Geoffrey Bryan Chua, Assistant Professor, Nanyang Technological University, Singapore
 Yan Feng, Student, Nanyang Technological University, Singapore

We consider a continuous review inventory problem with remanufacturing and setup costs whose optimal policy structure remains unknown. We examine two policies of the (r,Q) -type and provide algorithms to obtain optimal policy parameters. A closed-form approximation for average recoverable inventory further reduces complexity to that of the classical no-remanufacturing problem.

025-0601 Dynamic Pricing and Production Decision for Hybrid System with Remanufacturing

George Shanthikumar, Professor, Purdue University, United States
 S. Phil Kim, Student, Purdue University, United States

The joint production-pricing decision problem in a closed-loop hybrid system is modeled as a Markov decision process. The stochastic returns are assumed to be correlated with the volume of circulation. There is a trade-off between the revenue loss due to low pricing and the cost saving from recoverable items.

025-0907 A Non-Parametric Adaptive Algorithm for an Inventory Problem with Unobserved Lost Sales

Arnab Bisi, Assistant Professor, Purdue University, United States
 Karanjit Kalsi, Engineer, Purdue University, United States
 Golnaz Abdollahian, Engineer, Purdue University, United States

We address the problem of determining stocking quantities in a periodic-review inventory system with unknown demand distribution and unobserved lost sales. Using a convex quadratic under-estimator technique, we develop a non-parametric adaptive algorithm that produces inventory policies over periods. We study convergence rate of our algorithm to the optimal solution.

151	Saturday, 01:30 PM - 03:00 PM, Scottsdale (Floor 5)	<i>Track:</i> Behavioral Operations
	<i>Session:</i> Behavioral Studies on Pricing, Forecasting and Competition in Supply Chains	
	<i>Chair(s):</i> Feryal Erhun Yaozhong Wu	

025-0222 How to Compete Against a Behavioral Newsvendor

Elena Katok, Professor, Penn State University State College, United States
 Brent Moritz, Assistant Professor, Penn State University State College, United States
 Anton Ovchinnikov, Assistant Professor, Darden School of Business, United States

We study the behavioral aspects of newsvendor competition. Do the well-known behavioral biases propagate in a competitive environment? And if they do, then how can a knowledgeable newsvendor capitalize on the biases of the competitor? We address these questions through a combination of theoretical results and lab experiments.

025-0779 Complexity as a Contract Design Factor: A Human-to-Human Experimental Study

Basak Kalkanci, Student, Massachusetts Institute Of Technology, United States
 Kay-Yut Chen, Principal Scientist, Hp Labs, United States
 Feryal Erhun, Assistant Professor, Stanford University, United States

Exploring the tension between theory and practice regarding complexity and performance in contract design is especially relevant. The goal of this paper is to understand why simpler contracts may commonly be preferred in practice despite being theoretically suboptimal in a human supplier-human buyer experimental setting.

025-1018 Demand Forecasting Behavior: Fast, Slow and Just Right

Brent Moritz, Assistant Professor, Penn State University State College, United States
 Enno Siemsen, Assistant Professor, University Of Minnesota, United States
 Mirko Kremer, Assistant Professor, Penn State University State College, United States

This research analyzes how decision speed in time series forecasting impacts performance. Using a behavioral experiment, we find that individual tendencies for decisions that are too fast or slow lead to poorer performance. These tendencies are related to cognitive reflection; we compare results to other explanations of performance.

025-1088 Understanding Preferences for Suboptimal Contracts

Rebecca Hamilton, Associate Professor, University Of Maryland, United States
 Wedad Elmaghraby, Associate Professor, University Of Maryland, United States
 Anna Devlin, Student, Smith School, United States

We examine behavioral biases driving supplier preferences for economically inferior contracts. Our experiments incorporate a two period selling season during which retailers may sell items on sale. Interdependence between the parties and uncertainty in the second period influence contract preferences more than the number of parameters to be chosen.

025-0216 Peer-Induced Fairness in Pricing Decisions in Supply Chains

Teck-Hua Ho, Professor, University Of California Berkeley, United States
 Xuanming Su, Associate Professor, University Of California Berkeley, United States
 Yaozhong Wu, Associate Professor, National University Of Singapore, Singapore

We report an experimental study on how upstream and downstream parties make pricing decisions in supply chains. We find that behavioral regularities in social contexts, namely fairness and reciprocity, are important forces in determining supply chain transactions and the expressions of them are affected by the structures of supply chains.

152	Saturday, 01:30 PM - 03:00 PM, Lincolnshire II (Floor 6)	<i>Track:</i> Empirical Research in OM
	<i>Session:</i> Empirical Research in Operations Management VI	
	<i>Chair(s):</i> Anupam Agrawal	

025-0170 Organizing for Quality

Anupam Agrawal, Assistant Professor, University Of Illinois Urbana-Champaign, United States

We suggest that organizational learning in the area of quality control can be enhanced by deploying organizational structures dedicated to foster conceptual knowledge creation between a firm and its suppliers. Such innovative structures foster development of long term learning of cause and effect in the quality arena.

025-0875 Employee Initiative and Strategic Direction for Continuous Process Improvement

Gopesh Anand, Assistant Professor, University Of Illinois Urbana-Champaign, United States

Continuous improvement initiatives rely on participation of frontline employees for their success. At the same time, upper management plays a critical role in providing strategic direction for such initiatives. This research studies organizational practices related to employee participation and strategic direction, and focuses on the interrelationships between them.

025-0580 The Impact of Incumbent Biasing on Procurement Performance

Mark Ferguson, Professor, University Of South Carolina, United States
 Christopher Held, Student, Georgia Institute Of Technology, United States

Using an empirical model that identifies the key trade-offs in proposed commitment with suppliers, we explore the impact of the practice of incumbent biasing in repeat contract awarding. We show that biasing has two competing mechanisms by which it impacts procurement performance and under what conditions it is optimal.

025-0027 Ergonomics Aspects and Productivity in a Production Line: A Case Study

João Camarotto, Professor, Universidade Federal De São Carlos, Brazil
 Roberto Rodrigues, Student, Universidade Nove De Julho, Brazil

Rosangela Vanalle, Professor, Universidade Nove De Julho, Brazil

This paper presents a case study of an ergonomic intervention. It discusses the strategies adopted in an assembly line to perform the tasks in a flexible work environment and to meet the individual forms of work organization to reduce the workload, and changes in product mix of the line.

153	Saturday, 01:30 PM - 03:00 PM, Ohio State (Floor 6) <i>Session:</i> Best Papers Presentation <i>Chair(s):</i> Nezh Altay	<i>Track:</i> Humanitarian Operations and Crisis Management
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025-1138 Relating Disaster Response to 'Business-as-Usual': A New Taxonomy of Operations
 Natalie Simpson, Associate Professor, University at Buffalo (SUNY), United States

Disaster response is not readily categorized by the influential taxonomies of operations management. Through iterative triangulation, we identify patterns of attributes in published case studies and derive a new framework for this domain, highlighting intriguing similarities between successful disaster response and endeavors such as rapid software development and artistic ensembles.

025-0811 Supply Chain Management at Humanitarian Organizations - A Structuring Framework for Sustainable School Feeding

Stefan Spinler, Professor, Whu - Otto Beisheim School Of Management, Germany
 Luk Van Wassenhove, Professor, INSEAD, France
 Andreas Kretschmer, Student, Whu - Otto Beisheim School Of Management, Germany

School feeding is an established developmental intervention traditionally run by international organizations. Recently the focus shifted to develop sustainable local programs and supply chains. In this paper we propose a theoretical framework that structures the main factors of school feeding supply chains that are relevant to achieve program sustainability.

025-0427 Improving the Public Distribution of Essential Medicines in Sub-Saharan Africa: The Case of Zambia

Prashant Yadav, Director of Healthcare Research, William Davidson Institute at University of Michigan, United States
 Zachary Leung, Student, Massachusetts Institute Of Technology, United States
 Jeremie Gallien, Associate Professor, London Business School, United Kingdom

Despite successful improvements efforts by the government and partners, the public pharmaceutical distribution system in Zambia still results in low service levels relative to private sector standards. We present an alternative design involving mobile devices and optimization. Simulation results suggest that it would increase drug availability and reduce inventory costs.

025-0367 Decentralization and Earmarked Funding in Humanitarian Logistics for Relief and Development

Alfonso Pedraza-Martinez, Assistant Professor, Indiana University Bloomington, United States
 Maria Besiou, Assistant Professor, Kuehne Logistics University, Germany
 Luk Van Wassenhove, Professor, INSEAD, France

We study the International Humanitarian Organizations dual mission of relief and development in decentralized, stochastic operations with earmarked funding. Focusing on equity and efficiency we find that a system with local procurement and low lead time takes longer to respond than a system with global procurement and high lead time.

154	Saturday, 01:30 PM - 03:00 PM, Purdue (Floor 6) <i>Session:</i> Strategic Consumers and Competitors <i>Chair(s):</i> Ram Bala	<i>Track:</i> Marketing and OM Interface
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025-0112 Filling Seats at a Theater: Estimating the Impact of Posted Prices and Dynamic Discounts

Necati Tereyagoglu, Student, University Of Pennsylvania, United States
 Senthil Veeraraghavan, Associate Professor, University Of Pennsylvania, United States

Promoting concerts faces several customer-related challenges. To manage such challenges, we develop a competing-proportional-hazard framework that models the effects of an organization's decisions on consumer's tendency to purchase a seat over time. We test our model over a sales dataset of 53 concerts of an orchestra and suggest pricing strategies.

025-0040 Competition, Capacity and Evergreening

Ram Bala, Assistant Professor, Indian School Of Business, India
 Sumit Kunnumkal, Assistant Professor, Indian School Of Business, India
 Milind Sohoni, Associate Professor, Indian School Of Business, India

Evergreening is a strategy to deal with patent expiration and consequent loss of monopoly position by introducing an upgrade with a new patent. We analyze a two stage competitive game between an incumbent and a generic entrant where the firms commit to capacities before uncertainty resolution and then set production quantities. We uncover insights on the equilibrium product line decision for the incumbent and capacity decisions for both firms.

025-0028 Flexible vs. Dedicated: Delivery System Choice for a Vertically Differentiated Product Line

Ram Bala, Assistant Professor, Indian School Of Business, India
 Aditya Jain, Assistant Professor, Indian School Of Business, India
 Sandeep Rath, Student, University Of California Los Angeles, United States

We consider a firm that offers a vertically differentiated product line to customers who vary in their willingness-to-pay for quality and also in their sensitivity to waiting time. We explore the firm's delivery system choice between an integrated delivery system and a delivery system that dedicates capacity for each customer segment.

025-0926 Contract Choice for Online Advertising

Kinshuk Jerath, Assistant Professor, Carnegie Mellon University, United States
 John Turner, Assistant Professor, University Of California Irvine, United States

We study an ad network's optimal contract choice for two classes of campaign contracts that treat audience uncertainty differently, characterize the drivers that influence advertisers to choose one type of contract over the other, and study when the ad network prefers to offer one or more of these contracts.

155	Saturday, 01:30 PM - 03:00 PM, Great America II (Floor 6) <i>Track:</i> OM Practice
	<i>Session:</i> Using OM to Reduce Transportation Costs
	<i>Chair(s):</i> Ann Campbell

025-0218 The Use of Telemetry to Improve Routing Costs
 Ann Campbell, Associate Professor, University Of Iowa, United States
 Amit Verma, Student, University Of Iowa, United States

Telemetry units can be used to transmit inventory levels of many products to vendors. Frequent inventory readings can be helpful to prevent stockouts as well as prevent making costly deliveries too early. Our work, inspired by a project with NuCO₂, looks at the question of where to put telemetry units.

025-1347 A Min-Mean-Max Approach to Routing Problems with Correlated Costs
 Timothy Urban, Professor, The University Of Tulsa, United States

Empirical studies have shown that the time/cost to travel one link of a transportation network is often correlated with that of others; however, the routing literature has not taken this phenomenon into consideration. An analytical investigation of a min-mean-max approach to solving routing problems is conducted; computational results are presented.

156	Saturday, 01:30 PM - 03:00 PM, Dupage (Floor 3) <i>Track:</i> Scheduling and Logistics
	<i>Session:</i> Supply Chain Scheduling
	<i>Chair(s):</i> George Steiner

025-0704 Bicriteria Scheduling with Batch Deliveries
 Jianbo Qian, Student, McMaster University, Canada
 George Steiner, Professor, McMaster University, Canada

When dealing with conflicting objectives in scheduling problems, most researchers combine them into one single function. To get better insights into these objectives, we present polynomial-time algorithms to give Pareto-optimal solutions for various scheduling problems related to batch deliveries, using dynamic programming techniques.

025-0943 Approximation Schemes for Parallel Machine Scheduling with Availability
 Yumei Huo, Associate Professor, City University Of New York, United States
 Bin Fu, Associate Professor, University Of Texas Pan American, United States
 Hairong Zhao, Associate Professor, Calumet, United States

We investigate the problems of scheduling n jobs to m parallel-machines with availability constraints to minimize the total weighted completion time. Assume that jobs are non-resumable and the processing time of each job is equal to its weight, we developed PTASes for the preventive model and the fixed job model.

025-1076 Single machine batch scheduling with release times and delivery costs
 Esaignani Selvarajah, Assistant Professor, University Of Windsor, Canada
 George Steiner, Professor, McMaster University, Canada
 Rui Zhang, Student, McMaster University, Canada

We study single machine batch scheduling with release times. Our goal is to minimize holding and delivery costs. Since the problem is NP-hard, we present an approximation algorithm when jobs have the same unit holding cost. We also present a metaheuristic algorithm for the general case. Performance of the heuristic algorithm is checked with a lower bound algorithm and the results show the heuristic algorithm gives close to optimal solution.

025-1382 Solution Approaches for a Joint Production and Transportation Planning Problem
 Utku Koc, Student, Bilkent University, Turkey
 Aysegul Toptal, Assistant Professor, Bilkent University, Turkey
 Ihsan Sabuncuoglu, Professor, Bilkent University, Turkey

We consider the joint production and outbound-transportation planning of a manufacturer. The manufacturer has to schedule the processing and the delivery of orders to customers using a combination of heterogeneous vehicles. We propose different solution approaches and compare them based on an analytical and numerical investigation of the underlying sub-problems.

025-0553 Optimal delivery time quotation in supply chains to minimize tardiness and delivery costs
 George Steiner, Professor, McMaster University, Canada
 Rui Zhang, Student, McMaster University, Canada

We study delivery time quotation problems in supply chains, minimizing the sum of the weighted number of tardy jobs, the quotation costs and the batch-delivery costs. Since the general problem is strongly NP-hard, we develop a pseudo-polynomial algorithm and an FPTAS, and a polynomial algorithm for two special cases, respectively.

157	Saturday, 01:30 PM - 03:00 PM, Ballroom A (Floor 5) <i>Track:</i> Sustainable Operations
	<i>Session:</i> Carbon Emissions in Transportation
	<i>Chair(s):</i> Jan Fransoo

025-0429 Effect of carbon emission regulations on transport mode selection
 Kristel Hoen, Student, Eindhoven University of Technology, Netherlands
 Jan Fransoo, Professor, Eindhoven University of Technology, Netherlands
 Geert-Jan van Houtum, Professor, Technische Universiteit Eindhoven, Netherlands
 Tarkan Tan, Assistant Professor, Eindhoven University of Technology, Netherlands

We consider a 'carbon-aware' company that is reconsidering the transport mode selection decision. We find that even though large emission reductions can be obtained by switching to a different mode, the actual decision depends on the regulation and non-monetary considerations, such as lead time variability.

025-1266 The Impact of Carbon Regulations on Emission in Transportation

Edgar Blanco, Professor, Massachusetts Institute Of Technology, United States
Jan Fransoo, Professor, Eindhoven University of Technology, Netherlands

We analyze the various policies that are being deployed in various regions of the world. We argue that due to low price elasticity, and the specific characteristics of the role of transportation in the supply chain, policies based on monetary incentives are unlikely.

158	Saturday, 01:30 PM - 03:00 PM, Denver (Floor 5) <i>Session:</i> Sustainable Supply Chain Management <i>Chair(s):</i> Matteo Kalchschmidt	<i>Track:</i> Sustainable Operations
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025-0129 Traceability in the Cocoa Supply Chain: Perspective from Indonesian Cocoa Sector

Matteo Kalchschmidt, Associate Professor, Universita Degli Studi Di Bergamo, Italy
Normansyah Syahrudin, Student, Universita Degli Studi Di Bergamo, Italy

The multi - events of food alerts and food risks which occurred in a lengthy period and various locations, grows consumer's concern. Therefore good traceability system that capable in revealing the problems occurred along the chains is needed. The paper aims at linking traceability to sustainable performances of supply chain.

025-0165 The Value of Information Systems for Product Recovery

Bill Kettinger, Professor, Fogelman College of Business & Economics, United States
Tina Wakolbinger, Professor, Vienna Univ Of Econ & Business Admin, Austria
Fuminori Toyasaki, Assistant Professor, York University, Canada

This paper sheds light on the role of "Green IS" in product recovery management. We find that implementing Green IS ends up reducing manufacturers' profit under a highly time efficient decentralized collection structure; and that negotiation with competitors leads to a win-win situation for consumers and manufacturers.

025-1258 Implementing sustainable supply chain management: the role of supply chain management investments and global sourcing

Matteo Kalchschmidt, Associate Professor, Universita Degli Studi Di Bergamo, Italy
Ruggero Golini, Assistant Professor, Universita Degli Studi Di Bergamo, Italy
Jury Gualandris, Student, Universita Degli Studi Di Bergamo, Italy

We address how sustainable supply chain management (SSCM), supply chain management (SCM) and global sourcing (GS) interact with each other to determine higher sustainability performance. We rely on a sample of 413 companies. We found that SSCM lead to higher performance. Moreover, this relationship is significantly moderated by SCM and GS.

159	Saturday, 01:30 PM - 03:00 PM, Ballroom H (Floor 5) <i>Session:</i> Teaching Service Operations Management to Business School Students <i>Chair(s):</i> Scott Sampson	<i>Track:</i> Teaching in OM
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025-0058 Effectively covering Service Operations in a traditional OM course

Scott Sampson, Professor, Brigham Young University, United States

Many OM courses include brief and/or weak coverage of service operations, even though services dominate developed economies. This tutorial will show you how to make Service OM a high point of your OM course, reviewing how to present important SOM topics in a way that is interesting, rigorous, and engaging.

160	Saturday, 01:30 PM - 03:00 PM, Illinois (IL) (Floor 6) <i>Session:</i> Topics on the Operations - Economics Interface <i>Chair(s):</i> George Georgiadis Christopher Tang	<i>Track:</i> General Track
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025-0082 Price Signaling in a Congested Environment

Uday Rajan, Professor, Ross School of Business, University of Michigan, United States
Senthil Veeraraghavan, Associate Professor, University Of Pennsylvania, United States
Laurens Debo, Associate Professor, University Of Chicago, United States

We study how prices and queues can be used to signal quality. We show that a high-quality firm can signal quality with a higher price than the low-quality firm. However, high-quality firm leaves one valuable and natural source of information for the consumers unused: the queue length. We demonstrate the existence of pooling equilibria in which the high and low-quality firm both select the same price. The high-quality firm signals quality with longer queues that naturally emerge.

025-0104 Projects and Team Dynamics

George Georgiadis, Student, University Of California Los Angeles, United States

This paper studies the dynamic collaboration of a team when the goal is to complete a project. The main focus is how teams ought to be formed in partnerships and in corporations. Furthermore, I investigate the collaboration between asymmetric agents, and how a team should choose among different projects.

025-1003 Material Release Scheduling in Project-Based Supply Chain Management

Shi Chen, Student, Stanford University, United States
Hau Lee, Professor, Stanford University, United States

We consider a project with a series of tasks in which specific materials are needed for the respective tasks. We derive the optimal dynamic material release schedules. We explore potential values of re-sequencing the project tasks and expanding flexibilities of material releases through tighter supplier integration or material design choices.

025-1699 A Dynamic Level-k Model in Extensive-form Games

Teck-Hua Ho, Professor, University Of California Berkeley, United States
Xuanming Su, Associate Professor, University Of California Berkeley, United States

Backward induction is the most widely adopted principle for solving dynamic games. However, people frequently violate backward induction. We propose an alternative decision model that captures systematic ways in which people deviate from backward induction.

161	Saturday, 01:30 PM - 03:00 PM, Ballroom B (Floor 5) <i>Session:</i> Economics of Supply Chain Management <i>Chair(s):</i> Canan Savaskan	<i>Track:</i> Supply Chain Management
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025-0197 How Cooperative can Firms be in Green Production?

Laurens Debo, Associate Professor, University Of Chicago, United States
 Greys Susic, Associate Professor, University Of Southern California, United States
 Fang Tian, Student, University Of South California, United States

To explain the different size of manufacturer recycling alliances, we consider the Economies of Scale as the driver of forming (larger) alliances and the Product Diversity as the obstacle. With this idea, our paper established an Oligopoly Cournot model, and identified the stable market structures from a farsighted view.

025-0188 Driving Technology Innovation Down a Competitive Supply Chain

Dan Adelman, Professor, University Of Chicago, United States
 Rodney Parker, Associate Professor, University Of Chicago, United States
 Ayhan Aydin, Student, University Of Chicago, United States

We investigate upstream price incentives, and the competitive advantage from technology leadership in supply chains with substantial technology investment requirements, motivated by an industry partner in web content delivery industry. We ask: Under competition, how can an upstream firm encourage downstream businesses to invest in their products, and recoup benefits?

025-0740 Extended Producer Responsibility for Pharmaceuticals

Isil Alev, Student, Georgia Institute Of Technology, United States
 Atalay Atasu, Assistant Professor, Georgia Institute Of Technology, United States
 Ozlem Ergun, Associate Professor, Georgia Institute Of Technology, United States
 Beril Toktay, Professor, Georgia Institute Of Technology, United States

With increased concerns about the environment and public health, managing pharmaceutical overage through take-back programs is gaining popularity. In this work, we consider a game-theoretic model focusing on the interactions between manufacturers, physicians, and patients to investigate the effectiveness of extended producer responsibility in improving stakeholder welfare in this context.

025-0205 When Does the Devil Make Work? An Empirical Study of the Impact of Workload on Servers' Performance

Serguei Netessine, Emeritus Professor, INSEAD, France
 Tom F. Tan, Student, University Of Pennsylvania, United States

We use an exogenous shock to disentangle the endogeneity between demand and supply in staffing decisions. We find a non-linear relationship between workload and performance, which justifies why reducing staffing can sometimes achieve both higher sales and lower labor costs.

162	Saturday, 01:30 PM - 03:00 PM, Houston (Floor 5) <i>Session:</i> Tactical Supply Chain Decisions 2 <i>Chair(s):</i> Arthur Hill	<i>Track:</i> Supply Chain Management
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025-0635 Forecasting the Effectiveness of a Time Series Forecasting System

Arthur Hill, Professor, University Of Minnesota, United States
 Gerald Burch, Student, Virginia Commonwealth University, United States
 Weyong Zhang, Assistant Professor, Virginia Commonwealth University, United States

We define forecastability as an economic benefit measure of a forecasting system based on the reduction in safety stock inventory. We then identified plausible predictors. Using several large scale empirical datasets, we estimated, calibrated, and validated a parsimonious three-predictor "Forecasting the forecastability ratio" (FFR) model, with R2 greater than 40%.

025-0749 Carrier Managed Transportation in Supply Chain Management

James Bookbinder, Professor, University Of Waterloo, Canada
 Jie Liu, Logistics Analyst, University Of Waterloo, China

Motivated by VMI, we propose a new collaboration policy, Carrier Managed Transportation (CMT). Traditionally, the client (shipper or consignee) would decide the timing of shipments of products. In CMT, however, through information sharing, the carrier (trucking company) makes these decisions on the client's behalf. We analyze the impact of CMT.

025-0798 Optimal ordering decisions of single period split order divergent supply chain

Kalpana P, Student, Indian Institute Of Technology Madras, India
 Arshinder Kaur, Assistant Professor, Indian Institute Of Technology Madras, India

We consider a two-echelon divergent Supply Chain (SC) dealing with short life cycle products. This paper analyses the conventional single period inventory model, introduces the concept of splitting a single order into two orderings seeking to increase the total SC profit as well as the individual SC members.

025-0841 The Square Root Law for Cycle Inventory and Integrated Supply Chain Network Optimization

George Polak, Professor, Wright State University, United States
 James Hamister, Assistant Professor, Wright State University, United States
 Michael Magazine, Professor, University Of Cincinnati, United States

We propose a deterministic model that integrates inventory management and logistics decisions in a three-echelon supply chain. The inclusion of inventory management costs causes the objective function to be non-convex and non-separable, but we formulate a linear program that provides both a lower bound and a feasible solution.

164	Saturday, 01:30 PM - 03:00 PM, Ballroom F (Floor 5)	<i>Track:</i> Product Innovation and Technology Management
	<i>Session:</i> Innovation in Start-up Firms	
	<i>Chair(s):</i> Sinan Erzurumlu	

025-0237 Dynamic Knowledge Creation from Exploration and Exploitation in the High-Tech Venture

Cheryl Gaimon, Professor, Georgia Institute Of Technology, United States
Jennifer Bailey, Student, Georgia Institute Of Technology, United States

We develop a model of exploration and exploitation for a high-tech venture. Two features of our model are the dynamic impact of learning on absorptive capacity and also on the mean and variance of innovation outcomes. We determine when the typical explore-exploit versus an atypical exploit-explore sequential strategy is optimal.

025-0511 Cash and Advice: What is the Most Valuable Portfolio for the Startup Firm?

Nitin Joglekar, Associate Professor, Boston University, United States
Fehmi Tanrisever, Assistant Professor, Eindhoven University of Technology, Netherlands
Moren Levesque, Professor, York University, Canada
Sinan Erzurumlu, Assistant Professor, Babson College, United States

We approach the startup development process from the entrepreneur's perspective, and examine the optimal asset portfolio of cash and managerial advice for the startup firm. In particular, we ask: "What portfolio of financial and non-financial assets of the investor should the startup consider in its relationship formation with the investor?"

025-0834 Growing through innovation replicability: The role of investment in routine adaptation

Juliana Hsuan, Associate Professor, Copenhagen Business School, Denmark
Moren Levesque, Professor, York University, Canada

We propose a formal model of firm growth through the replication of business routines. We use a utility function that involves tradeoffs between growth and failure potential. We characterize the dynamics of selecting an investment-based growth policy and the role played by the market's economic environment targeted for expansion.

025-1611 Incentives for Innovation and the Implications of Project Failure

Raul Chao, Assistant Professor, University Of Virginia, United States
Jeremy Hutchison-Krupat, Assistant Professor, University Of Virginia, United States

Most innovation projects are executed by cross functional teams. This paper reports the results of a controlled experiment aimed at understanding how financial rewards and penalties impact a manager's decisions when they are engaged in such teams and face an uncertain (innovative) initiative.

165	Saturday, 01:30 PM - 03:00 PM, Los Angeles (Floor 5)	<i>Track:</i> Production Planning and Scheduling
	<i>Session:</i> Tools and Applications of Production Systems	
	<i>Chair(s):</i> Jian Yang	

025-0311 Approximate Treatments of Dynamic Pricing under Competition

Jian Yang, Associate Professor, New Jersey Inst Of Technology, United States

We deal with dynamic pricing under competition using the nonatomic game approach, wherein a continuum of infinitesimal sellers set prices to sell goods in a given horizon. We show that equilibrium pricing policies exist, which can serve as near equilibria for finite-firm situations when there are enough firms.

025-0436 Multi-Objective Scheduling on Parallel Machines with a Cost Criterion

Michael Pinedo, Professor, New York University, United States
Joseph Leung, Professor, New Jersey Inst Of Technology, United States
Kangbok Lee, Assistant Professor, Rutgers University, United States

Consider a parallel machine environment with multiple objectives. One objective may be a classical scheduling objective (e.g., make-span, flow time). A second objective represents the total processing costs. The cost of processing a job on a machine depends on the job and on the machines. We perform a complexity analysis.

025-0551 Supply Risk Management in an Export-Processing System

Long Gao, Assistant Professor, University Of California Riverside, United States
Zhaolin Li, Senior Lecturer, The University Of Sydney, Australia

This paper studies a supply risk management problem in the export-processing trade model, where the retailer who has a certain targeted purchasing quantity, supplies an appropriate amount of raw materials, and the supplier receives the processing fee for processing and exporting the final products. The supplier faces stochastically proportional yields.

166	Saturday, 01:30 PM - 03:00 PM, Northwestern (Floor 6)	<i>Track:</i> Product Management
	<i>Session:</i> Pricing, Returns, and Customer Service	
	<i>Chair(s):</i> Yalcin Akcay	

025-0425 The Impact of Product Returns on Dual-Channel Supply Chain Design

Terry Harrison, Professor, Penn State University University Park, United States
Paolo Letizia, Student, Penn State University University Park, United States

Products sold over the Internet offer higher marginal value to the consumer than those sold at a retail store. However, there may be uncertainty about product fit. We study the manufacturer's strategic control of online versus retail sales and returns through prices determination and returns policies.

025-1322 On Pricing of Products with Heterogeneous Quality Levels

Yalcin Akcay, Assistant Professor, Koc University, Turkey

Fikri Karaesmen, Professor, Koc University, Turkey
Seray Aydin, Analyst, Yapi Kredi Bank, Turkey

We consider an inventory of items whose quality levels are heterogeneous. In this setting, all else being equal, customers have preferences for higher quality items and select them first. Assuming random demand, we investigate different inspection and pricing policies for such inventories and assess their impact.

025-1671 Cross selling investment products to private banking customers using behavioral finance

Yalcin Akcay, Assistant Professor, Koc University, Turkey
Serdar Sayman, Associate Professor, Koc University, Turkey
Ozden Gur Ali, Assistant Professor, Koc University, Turkey

We describe a real-life private banking application that involves a customized product suggestion to augment the customer's portfolio and bring about a win-win situation for the customer and the bank. Customer preferences and biases including risk are measured using a behavioral finance survey and incorporated into the portfolio optimization model.

025-1249 The Management approaches and the analysis categories of the productive system

Fabiano Goldacker, Professor, Universidade Federal De Santa Catarina, Brazil
Mayara Teodoro, Student, Universidade Federal De Santa Catarina, Brazil
Felipe Fontan, Student, Universidade Federal De Santa Catarina, Brazil
Cleiciele Albuquerque, Professor, Universidade Federal De Santa Catarina, Brazil
Rolf Erdmann, Professor, Universidade Federal De Santa Catarina, Brazil

This investigation's purpose was to sustain a set of analysis categories applicable to a productive system, based on Management approaches. The results show evidences of the influences of the Classical Approach over these categories. Categories like quality, environmental management and health and safety were frequently analyzed by the emerging tendencies.

167	Saturday, 01:30 PM - 03:00 PM, Ballroom C (Floor 5) <i>Track:</i> Healthcare Operations
	<i>Session:</i> Integrated Care and the Inpatient-Outpatient Interface
	<i>Chair(s):</i> Linda LaGanga

025-0421 Health Care Supply Chain for Specialty Care: The Role of IT Leveraging Competence in Mental Health

Kingshuk Sinha, Professor, University Of Minnesota, United States
David Zepeda, Student, University Of Minnesota, United States

One in four people experience a mental health condition in their lifetime. Making treatment affordable and cost effective requires the integration of mental and physical care through primary care. Using clinic level data we evaluate the effect of IT leveraging competence on the delivery of depression care in primary care.

025-0758 Let's work together! Healthcare coordination for patient-centered outcomes

Mark Vonderembse, Professor, University of Toledo, United States
Stephen Callaway, Assistant Professor, University Of Toledo, United States
David Dobrzykowski, Assistant Professor, Eastern Michigan University, United States

This study investigates how hospital culture affects coordination activities - physician partnership and patient relationship - in healthcare delivery. These activities influence physician performance and patient responsiveness with an aim toward patient-centered outcomes. SEM results from 302 acute care hospitals support hypotheses linking culture to coordination activities and ultimately patient-centered

025-0937 Resource Optimization in Healthcare

David Fischer, Surgeon, Tria Orthopaedic Center, United States
Sanjeev Bordoloi, Associate Professor, University Of St. Thomas, United States

Although healthcare differs from manufacturing, there are several similarities that make it possible to extend concepts from Toyota to healthcare management. Using Lean principles, this paper tries to optimize resource utilization in a clinic similar to Toyota's mixed-model assembly line. Our model maximizes patient-mix throughput within current resource availability.

025-1105 Lean Integration of Inpatient and Outpatient Care

Robert Bremer, Executive Director, Colorado Access, United States
Linda LaGanga, Director of Quality Systems & Operational Excellence, Mental Health Center Of Denver, United States

We conducted and implemented a lean process improvement project driven by the need to reduce excessive emergency department costs. Improved coordination and communication between inpatient and outpatient providers was achieved to avoid hospitalization and reduce expenses. This demonstrates opportunities to improve healthcare operations through proactive and coordinated care.

168	Saturday, 01:30 PM - 03:00 PM, Kansas City (Floor 5) <i>Track:</i> Healthcare Operations
	<i>Session:</i> Appointment Scheduling
	<i>Chair(s):</i> Zhichao Zheng Qingxia Kong

025-0573 Developing Appointment Schedules with Genetic Algorithms

Beatrice Ombuki-Berman, Associate Professor, Brock University, Canada
Adrian Harrington, Student, Brock University, Canada
Ken Klassen, Professor, Brock University, Canada

A computational intelligence methodology based on genetic algorithms is used to determine the best schedules while varying: the size of the clinic, service time mean and variance, and the interaction between these factors. A comparison of different multi-objective strategies including Pareto ranking and summed rank methods is presented.

025-0610 Sequencing and Scheduling Appointments with Potential Call-In Patients

Lawrence Robinson, Professor, Cornell University, United States
Rachel Chen, Associate Professor, University Of California Davis, United States

Clinics often face patients with different levels of urgency for their medical needs. This paper studies an appointment scheduling system that accommodates routine patients who book well in advance as well as same-day patients with acute needs who call in the morning for an appointment later that day.

025-1132 Appointment Sequencing and Scheduling with Limited Distributional Information

Ho-Yin Mak, Assistant Professor, Hong Kong University Of Science & Tech, Hong Kong
 Ying Rong, Assistant Professor, Shanghai Jiao Tong University, China
 Jawei Zhang, Associate Professor, New York University, United States

We consider the appointment sequencing and scheduling problem by assuming only limited distributional information of the service durations such as mean and variance, or mean and support. We show that the mean-variance scheduling model can be formulated as a separable quadratic minimization problem over a single resource constraint.

025-1560 Appointment Sequencing: Is the Smaller-Variance-First Rule Optimal?

Qingxia Kong, Student, National University Of Singapore, Singapore
 Chung-Yee Lee, Professor, Hong Kong University Of Science & Tech, China
 Chung-Piaw Teo, Professor, National University Of Singapore, Singapore
 Zhichao Zheng, Student, National University Of Singapore, Singapore

We investigate a stochastic appointment scheduling problem in a healthcare system. It has been conjectured in many studies that scheduling patients with smaller variance in service time first might be an optimal sequence. We use the "gambler's ruin" effect to obtain insights as to why the smaller-variance-first rule may not be optimal. We propose a distributionally robust model, and our analysis reveals some important managerial insights.

169	Saturday, 01:30 PM - 03:00 PM, Wisconsin (WI) (Floor 6) <i>Track:</i> Retail Operations
	<i>Session:</i> Retail Operations I
	<i>Chair(s):</i> Greys Susic

025-0118 Newsvendor Mergers

Soo-Haeng Cho, Assistant Professor, Carnegie Mellon University, United States
 Xin Wang, Student, Carnegie Mellon University, United States

A merger has received little attention from operations researchers despite its significant role in today's economy. This paper analyzes the effects of a merger of two price-setting newsvendors on prices, quantities, and profits. Our focus is on the role of demand uncertainty and substitution on the effects of a merger.

025-0064 Signaling to Capital Providers in the Newsvendor Model

William Schmidt, Student, Harvard University, United States
 Vishal Gaur, Associate Professor, Cornell University, United States
 Ananth Raman, Professor, Harvard University, United States

The possibility of an operational disruption is inherent in every firm, whether due to incompetent operational decision making or unlucky outcomes of competent decisions. Using a signaling model we explore a third potential source of disruptions - competent decision making that purposefully sub-optimizes the expected operational performance of the firm.

025-0499 Assortment Optimization in Retail Operations

Felipe Caro, Assistant Professor, University Of California Los Angeles, United States
 Victor Martinez-de-Albeniz, Associate Professor, I E S E, Spain
 Paat Rusmevichientong, Associate Professor, University Of Southern California, United States

We study the problem of assortment planning with applications to retail and revenue management. Given a planning horizon and a demand model, the goal is to determine the optimal assortment to offer in each time period. We present theoretical results and numerical experiments comparing our proposed policy with other heuristics.

025-1521 Study of Strategic Customer Behavior on Dynamic Pricing

Sriram Dasu, Associate Professor, University Of Southern California, United States
 Seungbeom Kim, Student, University Of Southern California, United States

Using laboratory experiments we investigate decision processes employed by consumers when discounted products may also stock-out. We find little support for decision processes assumed in theoretical pricing models. Quantal response based models are a better fit.

170	Saturday, 01:30 PM - 03:00 PM, River North (Floor 2) <i>Track:</i> Vendor and Supply Contracts
	<i>Session:</i> Sourcing Decisions
	<i>Chair(s):</i> Mazhar Arikan

025-0892 Wholesale Price-Only Contracts with Responsive Pricing

Yanyi Xu, Professor, East China University Of Science & Tehcnology, China
 Arnab Bisi, Assistant Professor, Purdue University, United States

We study wholesale price-only contracts with responsive pricing in a two-tier supply chain. For additive and multiplicative demand models, we establish sufficient conditions for the unimodality of profit functions and derive the unique optimal solutions. We also extend existing results on fixed retail price case and a revenue management problem.

025-0987 Role of an Intermediary in Risk Mitigation while Sourcing Funding for Projects

Sripad Devalkar, Assistant Professor, Indian School Of Business, India
 Milind Sohoni, Associate Professor, Indian School Of Business, India

Motivated by the operations of an Indian non-profit organization, we model an intermediary who funds development projects using internal or borrowed resources, and recoups the investment and operational costs by selling the outcomes of the project to individuals and/or philanthropic organizations, mitigating the risk for such donors.

025-0354 Co-Production and Co-Creation of Value: A Differential Games Approach
 Emre Demirezen, Student, Texas A&M University College Station, United States
 Subodha Kumar, Assistant Professor, Texas A&M University College Station, United States
 Bala Shetty, Professor, Texas A&M University College Station, United States

We study the contracting issues in general value co-creation environments like co-production or value co-creation. The output is contingent on the efforts of both the vendor and the client. We analyze several contracts in different continuous settings. Several managerial insights are gleaned that are unique to continuous collaboration settings.

025-1555 To buy or not to buy your remanufacturer
 Michael Magazine, Professor, University Of Cincinnati, United States
 Zachary Gillerlain, Student, University Of Cincinnati, United States

We examine whether or not an OEM should buyout its remanufacturer. Purchasing the remanufacturer provides the OEM less competition, control over the remanufactured product's quality, and the ability to charge a premium price on the used market because of brand equity. We show when these gains are worth the purchase.

171	Saturday, 01:30 PM - 03:00 PM, Cook (Floor 3) <i>Session:</i> Supply Chain Risk and Information <i>Chair(s):</i> Zhibin Yang	<i>Track:</i> Supply Chain Risk
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025-0116 Timing and Signaling Considerations for Recovery from Supply Chain Disruption
 Zhibin Yang, Assistant Professor, University Of Oregon, United States
 Nagesh Murthy, Associate Professor, University Of Oregon, United States

We study the supplier's recovery decisions after a disruption when the buyer possesses a contingency option. The supplier uses the quote of recovery time as a strategic subsidy to retain the buyer and also as a signal for conveying the severity of disruption.

025-1353 Optimal Decision Rules for Product Recalls
 Ali Devin Sezer, Assistant Professor, Middle East Technical University, Turkey
 Cagri Haksoz, Assistant Professor, Sabanci University, Turkey

Our research proposes a model for product recalls and formulates the recall decision problem as one of optimal stopping. The optimal stopping rule for our model and its two extensions is proved to be a threshold rule for the recall likelihood ratio. Optimal thresholds are derived using dynamic programming.

025-0321 Compensating for Dynamic Supply Disruptions with Backup Flexibility
 Mark Van Oyen, Associate Professor, University Of Michigan Ann Arbor, United States
 Soroush Saghafian, Student, University Of Michigan Ann Arbor, United States

We study two powerful disruption risk mitigation mechanisms: (1) contracting with a secondary flexible supplier, and (2) monitoring the dynamic risk levels of primary suppliers. We model the dynamics of disruptions as discrete time Markov chains and analyze scenarios where a firm can or cannot assess the disruption risk levels.

025-0623 Consumer Panic Buying and Fixed Quota Policy
 Huachun Xiong, Student, Tsinghua University, China
 Max Shen, Professor, University Of California Berkeley, United States
 Biying Shou, Assistant Professor, City University Of Hong Kong, Hong Kong

We study consumer panic buying under supply disruptions and we investigate the retailer's optimal inventory and fixed quota policies. Rational expectation equilibrium framework is used to characterize consumers' behavior and the retailer's decisions. We demonstrate the cost of ignoring strategic consumer behavior and examine the effectiveness of fixed quota.

172	Saturday, 01:30 PM - 03:00 PM, Ballroom G (Floor 5) <i>Session:</i> Empirical Models in Service Operations <i>Chair(s):</i> Gad Allon	<i>Track:</i> Service Operations
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025-0415 Cheap Talk in Queues with Multiple Customer Classes
 Gad Allon, Associate Professor, Northwestern University, United States
 Achal Bassamboo, Associate Professor, Northwestern University, United States

We examine the problem of information communication by considering a model in which both the firm and the customers act strategically. In this model, the customers are heterogeneous both with regards to their waiting cost and the value they obtain from the service. We characterize the equilibrium language.

025-0378 Impact of Delay Announcement
 Gad Allon, Associate Professor, Northwestern University, United States
 Achal Bassamboo, Associate Professor, Northwestern University, United States
 Qiuping Yu, Student, Northwestern University, United States

Many service systems announce anticipated delay to the customers. In this paper, we explore the impact of such announcement. We study the data from a medium size call center where the customers are provided announcement concerning their delay. The data provides information about how long the customer stayed in system

025-0878 Empirical Analysis of Inventory Display Strategies in Retail
 Antonio Moreno-Garcia, Assistant Professor, Northwestern University, United States
 Santiago Gallino, Student, University Of Pennsylvania, United States

Using observational and experimental data from a retail setting, we study how inventory display and availability information affects demand.

025-1544 Is the Cue "In Stock" Always Effective? Inventory Information Disclosure Tactics to Leverage Stockout Risk

Tolga Aydinliyim, Assistant Professor, University Of Oregon, United States
Mike Pangburn, Associate Professor, University Of Oregon, United States
Elliot Rabinovich, Associate Professor, Arizona State University Tempe, United States
Min Choi, Student, Arizona State University Tempe, United States

We investigate whether an online retailer should divulge its stocking level, or merely indicate availability via the "in stock" cue, while optimally pricing its product. We find, analytically, that disclosing accurate inventory information can mitigate strategic consumer behavior, and support this finding via an empirical study of two online retailers.

173	Saturday, 01:30 PM - 03:00 PM, Miami (Floor 5) <i>Track:</i> OM and Economic Models
	<i>Session:</i> Networks, Pricing and Information in Operational Models
	<i>Chair(s):</i> Kostas Bimpikis Kimon Drakopoulos

025-1785 Systemic Risk and Stability in Financial Networks

Alireza Tahbaz-Salehi, Assistant Professor, Columbia University, United States
Daron Acemoglu, Professor, Massachusetts Institute Of Technology, United States
Asuman Ozdaglar, Associate Professor, Massachusetts Institute Of Technology, United States

We argue that contagion in financial networks exhibits a phase transition as interbank connections increase: as long as the magnitude of negative shocks affecting financial institutions is small, more "complete" interbank claims enhance the stability of the system. However, beyond a certain point, more interconnections lead to more fragility.

025-1786 Dynamic Pricing with Patient Customers: Structure and Computation of Optimal Policies

Ilan Lobel, Assistant Professor, New York University, United States
Omar Besbes, Assistant Professor, Columbia University, United States

We consider the revenue-maximization problem of a firm selling goods over time to customers with heterogeneous valuations and patience. We prove that the optimal pricing policy is composed of cycles with period at most twice the maximum willingness-to-wait. We also prove that the prices typically follow a non-monotonic cyclic behavior.

025-1787 An internet experiment on bargaining in networks

Yashodhan Kanoria, Student, Stanford University, United States
Andrea Montanari, Associate Professor, Stanford University, United States
Cindy Chang, Student, Stanford University, United States
Madison White, Student, Stanford University, United States

Exchange networks model the behavior of a set of players who need to reach pairwise agreements for mutual benefit, as in the labor market, the housing market and the 'market' for social relationships. We describe internet-based experiments on bargaining in networks, that are the largest such experiments to date.

025-1788 Timing the revelation of information in a model of experimentation

Kimon Drakopoulos, Student, Massachusetts Institute Of Technology, United States
Kostas Bimpikis, Assistant Professor, Stanford University, United States

We study a model of strategic experimentation motivated by collective decision making with costly information acquisition or R&D and the innovation process. When the outcomes of experimentation are observable, free-riding results in inefficiently low experimentation. When an information aggregator holds all information and commits when to reveal it, efficiency increases.

176	Saturday, 03:30 PM - 05:00 PM, Scottsdale (Floor 5)	<i>Track:</i> Supply Management
	<i>Session:</i> Supply Management: Empirical and Case Studies	
	<i>Chair(s):</i> Soroosh (Sam) Saghiri	

025-1400 Searching for the innovative supplier

Surya Pathak, Assistant Professor, University Of Washington Bothell, United States
 James Miller, Associate Professor, University Of Washington Bothell, United States
 Jayanth Jayaram, Professor, University Of South Carolina, United States

Extant research in sourcing indicates that manufacturers benefit from integrating suppliers into their innovation process. Is the reverse true? Do suppliers benefit from such integration? Using 30 years of panel data on 1845 firms and analytical treatment of our empirical findings, we discuss the traits of an innovative supplier.

025-1778 Green Supply Management and Supplier Development: Effects on Supplier Environmental Actions

Soroosh (Sam) Saghiri, Lecturer, Cranfield University, United Kingdom

This paper examines the relationship between the buying firm's environmental requirements and the suppliers' environmental actions. The mediating role of the supplier development plans is also investigated in analysing this relationship. The analysis is done based on a structural model using quantitative survey data collected in UK during summer 2010.

025-0018 Supplier Selection and Evaluation using DEA: A Case Study

Arqum Mateen, Student, Indian Institute Of Management Calcutta, India
 Dileep More, Assistant Professor, Indian Institute Of Management Calcutta, India

Companies often grapple with the question of selecting the right supplier. One approach to tackle this problem using DEA is presented that uses an ideal target for each selection criteria, and then identifies the best supplier available. We have empirically illustrated this approach using the case of an Indian company.

025-0850 A Quantitative Analysis Applying Agency Theory to Purchasing Department Involvement

Susana Pereira, Professor, Fundacao Getulio Vargas, Brazil
 Gustavo Pereira, Student, Fundacao Getulio Vargas, Brazil

Involving purchasing department (PD) in the sourcing process adds value by improving costs, quality and service. Previous studies indicate that not all activities are under PD. This paper proposes a quantitative study applying agency theory (AT). As the main result, we present the relation between AT assumptions and PD involvement.

177	Saturday, 03:30 PM - 05:00 PM, Lincolnshire II (Floor 6)	<i>Track:</i> Empirical Research in OM
	<i>Session:</i> Workshop on Offshoring and Reshoring: Academic and Practitioner Perspectives	
	<i>Chair(s):</i> John Gray	

025-1160 Offshoring and Reshoring: Academic and Practitioner Perspectives

John Gray, Assistant Professor, Ohio State University, United States
 Keith Skowronski, Student, Ohio State University, United States

This session will include three parts. First, Harry Moser of the Reshoring Initiative (www.reshorenow.com) will present a tool to help companies analyze offshoring and reshoring decisions. Then, a practicing manager will share a case study. Finally, we will provide a structured review of the academic literature on location decisions.

178	Saturday, 03:30 PM - 05:00 PM, Ohio State (Floor 6)	<i>Track:</i> Humanitarian Operations and Crisis Management
	<i>Session:</i> Operational Challenges of Humanitarian Logistics	
	<i>Chair(s):</i> Alfonso Pedraza Martinez	

025-1252 On the Need to Reformulate Humanitarian Logistics: Deprivation Costs

Noel Perez, Student, Rensselaer Polytechnic Institute, United States
 Miguel Jaller, Student, Rensselaer Polytechnic Institute, United States
 Jose Holguin-Veras, Professor, Rensselaer Polytechnic Institute, United States

This discusses the necessity of enhancing the analytical formulations of humanitarian logistics so that they explicitly consider deprivation costs, and highlights the limitations of commonly used proxy measures. This research considers the loss in welfare associated with beneficiaries not having access to commodities and develops models minimizing.

025-1151 A decision making model for recovery operations on disasters management

M. Teresa Ortuno, Associate Professor, Universidad Complutense De Madrid, Spain
 Begona Vitoriano, Associate Professor, Universidad Complutense De Madrid, Spain
 Gregorio Tirado, Lecturer, Universidad Complutense De Madrid, Spain
 Federico Liberatore, Lecturer, Universidad Rey Juan Carlos, Spain

When a disaster arises usually the aid distribution network is damaged and decisions on its recovery must be made regarding the impact on accessibility to the affected people. A decision support model for planning the recovery of damaged elements, taking into account the medium term distribution planning will be presented.

025-1472 Fleet Management Coordination in Decentralized Humanitarian Operations

Sameer Hasija, Assistant Professor, INSEAD, Singapore
 Luk Van Wassenhove, Professor, INSEAD, France
 Alfonso Pedraza-Martinez, Assistant Professor, Indiana University Bloomington, United States

Motivated by extensive field research we study incentive alignment to coordinate humanitarian operations. In large international humanitarian organizations efficiency/equity balancing headquarters assign operational capacity to equity-oriented programs. This creates a misalignment of incentives complicated by earmarked funding of vehicles. We propose an operational mechanism design for system coordination.

025-1259 Emergency Vehicle Routing in Disaster Response Operations

Özden Tozanli, Student, Istanbul Kultur University, Turkey
 Ufuk Kula, Assistant Professor, Sakarya University, Turkey
 Saniye Tarakcio, Student, Istanbul Kultur University, Turkey

We develop a two-stage stochastic programming model to minimize the emergency vehicles' travel time during an earthquake. In the first stage of the model, the damage nodes are revealed and in the second stage, ambulances are assigned to the routes according to the priority of injuries occurred in each node.

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Saturday, 03:30 PM - 05:00 PM, Purdue (Floor 6)

Track: Marketing and OM Interface

Session: The Impact of Used Goods on Supply Chains

Chair(s): Mehmet Gumus

025-0133 Returns Policies between Channel Partners for Durable Products with Used Goods Markets

Saibal Ray, Associate Professor, Mcgill University, Canada
 Shuya Yin, Associate Professor, University Of California Irvine, United States
 Mehmet Gumus, Assistant Professor, Mcgill University, Canada

The recent growth of used goods markets has brought to light new issues regarding channel returns policies - specifically, how such markets would affect returns policies as well as the performance of chain partners. The objective of this paper is to address these issues.

025-0709 Effect of government subsidies on the adoption of resource efficient products

Steve Gilbert, Professor, University Of Texas Austin, United States
 Haoying Sun, Assistant Professor, Texas A&M University College Station, United States

We use the durable goods framework to study how various forms of government subsidy programs shift consumer's adoption of resource efficient products and how this in turn affects consumption of scarce natural resources.

025-0753 Joint Selling among Complementary Suppliers Selling Durable Components

Saibal Ray, Associate Professor, Mcgill University, Canada
 Shuya Yin, Associate Professor, University Of California Irvine, United States
 Yuhong He, Student, University Of California Irvine, United States

Suppliers of complementary goods often form alliances when selling their components to downstream retailers. This paper studies how product durability (measured by the strength of the used goods market), retailing competition and customers' strategic behavior affect such coordinating incentives.

025-0134 Capacity Investment and Allocation in Multi-channel Competitive Supply Chain

Greys Sosic, Associate Professor, University Of Southern California, United States
 Liang Han, Student, University Of Southern California, United States

We study a competitive supply chain with one manufacturer and one retailer. Based on different cost structures and order sizes from the retailer, the manufacturer makes different capacity investment and allocation decisions. We investigate the equilibrium inventory allocations and come up with contracts to coordinate the decentralized supply chain.

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Saturday, 03:30 PM - 05:00 PM, Great America II (Floor 6)

Track: OM Practice

Session: Panel: Supply Chains of the Future

Chair(s): Roberta Russell

025-1789 Supply Chains of the Future

Roberta Russell, Professor, Virginia Polytechnic Institute And State University, United States

A panel of practitioners from Wal-Mart, John Deere, Boeing and E2open presents issues and trends in supply chain management, and suggests avenues for academic/industry engagement. Join us for a lively discussion of supply chains of the future. This session is sponsored by the APICS E&R Foundation.

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Saturday, 03:30 PM - 05:00 PM, Dupage (Floor 3)

Track: Scheduling and Logistics

Session: Applied Scheduling in Manufacturing and Service

Chair(s): Zhixin Liu

025-0895 Bi-criteria Scheduling Subject to Machine Availability

Yumei Huo, Associate Professor, City University Of New York, United States
 Bin Fu, Associate Professor, University Of Texas Pan American, United States
 Hairong Zhao, Associate Professor, calumet, United States

We consider bi-criteria scheduling subject to machine availability. We focus on two parallel machines and the goal is to find preemptive schedules to optimize both makespan and total completion time subject to machine availability. Our main contribution is that we developed polynomial time optimal algorithms for three bi-criteria scheduling problems.

025-1196 Doing more does not mean doing better

Hong-xun Jiang, Associate Professor, Renmin University Of China, China
 Tian He, Student, Renmin University Of China, China
 Gang Li, Assistant Professor, Bentley University, United States

Service companies tend to utilize their expensive resources in a maximal utilization. Such a sensible decision, however, might result in higher costs. Our model captures key trade-offs among the decisions of equipment purchases, employee recruitment and training, and job-resource assignments. Effective algorithms are developed and new insights are derived.

025-1069 Design of Characteristic Functions for Cooperative Games in Operations Planning

Zhixin Liu, Assistant Professor, University Of Michigan Dearborn, United States
Nicholas Hall, Professor, Ohio State University, United States

We design approximate characteristic functions for intractable operations planning games. An algorithm is proposed to specify solution procedure, solution space of coalitions' optimization problems, dependence of coalition value on outside decisions, and effective coalition structure. Applications include economic lot sharing, knapsack problem, facility location, capacity allocation, k-median, and flowshop sequencing.

025-0171 Production Scheduling with Subcontracting: The Subcontractor's Pricing Game

Xiangtong Qi, Associate Professor, Hong Kong University Of Science & Tech, Hong Kong

We study a two-stage game with a manufacturer and a subcontractor who are faced by a production scheduling problem. The subcontractor can determine a unit price, and then the manufacturer follows to decide which jobs are subcontracted and how the schedules are made.

182	Saturday, 03:30 PM - 05:00 PM, Ballroom A (Floor 5) <i>Session:</i> Selected Topics <i>Chair(s):</i> Gamze Karayaz	<i>Track:</i> Sustainable Operations
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025-0004 Recovery of Overdue Credits in Low Income Areas in São Paulo City: The Public Sanitation Operation Case

Ivone Sato, Student, Universidade Nove De Julho, Brazil
Rosangela Vanalle, Professor, Universidade Nove De Julho, Brazil
Wagner Lucato, Professor, Universidade Nove De Julho, Brazil
Renato Sassi, Professor, Universidade Nove De Julho, Brazil
Marcio Romero, Student, Universidade Nove De Julho, Brazil

The objective of this paper is to demonstrate that by changing the conventional credit recovery approach a sustainable service operation can recapture overdue revenues at the same time it recovers former clients. This is done through a case study developed in a public sanitation company located in São Paulo-Brazil.

025-1051 Multi objective model for green fixed charge transportation problem

Kannan Govindan, Associate Professor, University Of Southern Denmark, Denmark
Devika Kannan, Student, University Of Southern Denmark, Denmark

This paper proposes a multi-objective optimization model by considering the carbon emission into a fixed charge transportation problem. This paper uses a non-dominated sorting genetic algorithm (NSGA)-II to solve the proposed model. The proposed model aims at finding the tradeoff between the minimum total cost and minimum carbon emission.

025-1520 Project Execution Challenge for Sustainable Operations

Gamze Karayaz, Assistant Professor, ISIK University, Turkey

Sustainable design has become a critical partner of sustainable operations, yet execution of the design is as important as the design itself. Initiatives applied throughout life-cycle-of processes addresses the challenge for successful execution of sustainable projects. This paper investigates the life-cycle-of projects and execution for sustainable operations.

025-1539 A Model of Workflow for Destination Residues from Manaus Free Trade Zone

Wanessa Nascimento, Student, Fundação de Apoio Institucional Rio Solimões, Brazil
Raimundo Vieira, Professor, Fundação de Apoio Institucional Rio Solimões, Brazil

The Manaus Free Trade Zone is comprised of a manufacturing park, all located in Manaus (Amazonas State in northern Brazil). This economic model has not a plan for destination of industrial residues. The aim this work is proposing a model with an integrated solution related to industrial waste management.

183	Saturday, 03:30 PM - 05:00 PM, Denver (Floor 5) <i>Session:</i> Women in POM: An International Perspective <i>Chair(s):</i> Cheryl Gaimon	<i>Track:</i> General Track
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025-1398 Women in POM: An International Perspective

Cheryl Gaimon, Professor, Georgia Institute Of Technology, United States

Panel Members: Wedad Elmaghraby (University of Maryland (US)) Susana Pereira (Fundacao Getulio Vargas (Brazil)) Kamalini Ramdas (London Business School (UK)) Aleda Roth (Clemson University (US)) Ann Vereecke (Vlerick Leuven Gent Management School (Belgium)). During this session, we will explore the unique path taken by each woman in developing her very substantial academic credentials. It will be interesting to see how each woman's experience is similar or different to others working in different parts of the world.

184	Saturday, 03:30 PM - 05:00 PM, Ballroom H (Floor 5) <i>Session:</i> Teaching Supply Chain Management <i>Chair(s):</i> Gal Raz	<i>Track:</i> Teaching in OM
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025-0051 Panel on Teaching Supply Chain Management

Gal Raz, Associate Professor, University Of Virginia, United States
Marshall Fisher, Professor, University Of Pennsylvania, United States
Nicole DeHoratius, Instructor, Zaragoza Logistics Center, United States

Supply Chain Management is taught in many business schools both in core courses and in electives. In this panel we will discuss the current state of Supply Chain Management and its role in the business curriculum. We will also explore the process of identifying gaps in the existing supply chain curriculum and discuss opportunities to fill those gaps through the development of case material. The panel will examine specific case examples of global companies operating in China such as Luen Thai and Yihaodian. We will conclude with interactive discussion with the audience.

185	Saturday, 03:30 PM - 05:00 PM, Illinois (IL) (Floor 6) <i>Session:</i> Regulation and Supply Chains <i>Chair(s):</i> Xi Chen	<i>Track:</i> Sustainable Operations
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025-0682 Simulation based Performance Measurement in Flexible and Adaptable Product Recovery System

Parikshit Charan, Assistant Professor, IIM Rohtak, India
 Jitendra Madaan, Assistant Professor, Indian Institute Of Technology Roorkee, India

Most real world problems are complex and difficult to comprehend in their entirety. This paper adopts a similar approach for studying supply chains flexibility and extending the approach to measure performance improvement in reverse supply chains. In light of increasing profit making opportunities and larger cost cutting initiatives, has become a daunting challenge for the enterprise to initiate product recovery practice. This paper presents flexible product recovery simulation models with the interactions of the process element, sub-models and cost-flow performance measure.

025-1081 The Influence of Technical, Market and Legislative Factors on E-Waste Flows

Fuminori Toyasaki, Assistant Professor, York University, Canada
 Anna Nagurney, Professor, University Of Massachusetts Amherst, United States
 Thomas Nowak, Student, Vienna Univ Of Econ & Business Admin, Austria
 Tina Wakolbinger, Professor, Vienna Univ Of Econ & Business Admin, Austria

In this paper, we analyze how technical, market, and legislative factors influence the total amount of e-waste that is collected, recycled and (legally and illegally) disposed of, the prices that sources of waste, processors and demand markets face, and the profits of the collectors and processors.

025-1128 Governmental regulation effects on the green product development

Maryam Hafezi, Student, Wilfrid Laurier University, Canada
 Xuan Zhao, Associate Professor, Wilfrid Laurier University, Canada
 Victor Shi, Assistant Professor, Wilfrid Laurier University, Canada

In this model, manufacturer faces to market segmentation through the environmental concerns of customers. Different scenarios are driven to show when designing the green product along with ordinary one can help the firm to improve its sustainability and what's the effect of governmental regulations on the decisions.

186	Saturday, 03:30 PM - 05:00 PM, Ballroom B (Floor 5) <i>Session:</i> Contracts and Conflicts in Supply Chains <i>Chair(s):</i> Gokce Esenduran	<i>Track:</i> Supply Chain Management
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025-0467 To Sell and to Provide? The Implications of the Auto Manufacturer's Involvement in the Car Sharing Business

Mark Ferguson, Professor, University Of South Carolina, United States
 Beril Toktay, Professor, Georgia Institute Of Technology, United States
 Ioannis Bellas, Student, Georgia Institute Of Technology, United States

We study the auto manufacturer's choice regarding whether to provide mobility service (e.g., car sharing) in conjunction with the traditional sales channel. We explicitly model the consumer's choice of transportation mode as well as vehicle usage decisions. Our results characterize the economic and environmental implications of this strategy.

025-0733 Risk Mitigation under Lead-time and Demand Uncertainty with Budget Constraints

John Park, Student, Syracuse University, United States
 Burak Kazaz, Associate Professor, Syracuse University, United States
 Scott Webster, Professor, Syracuse University, United States

This research investigates how relief organizations can maximize the supply of aid in the presence of lead-time and demand uncertainty with budget constraints. The variance in lead-time and demand in each country are big obstacles for relief organizations in order to supply medical and nutritional products within a given timeframe.

025-1117 Are Responsive Pricing and Supply Diversification Substitutes in Hedging Supply Uncertainty?

Suresh Sethi, Professor, University Of Texas Dallas, United States
 Jun Zhang, Assistant Professor, University Of Texas Dallas, United States
 Tao Li, Student, University Of Texas Dallas, United States

Responsive pricing and supply diversification are two strategies that firms adopt in order to hedge supply uncertainty. We find that, contrary to our intuition, responsive pricing and supply diversification are not necessarily strategic substitutes. Under certain conditions, they are actually complements.

025-1354 Managing Dual Distribution Channels under Uncertainty

Gokce Esenduran, Assistant Professor, Ohio State University, United States
 Lauren Xiaoyuan Lu, Assistant Professor, University Of North Carolina Chapel Hill, United States
 Jayashankar Swaminathan, Professor, University Of North Carolina Chapel Hill, United States

We consider a manufacturer with dual distribution channels. Under buyback programs manufacturer buys used rental items back from rental agency and sells them through dealer. Prior research shows that buyback program alleviates channel conflicts. We study how demand uncertainty and buyback price commitment affect channel conflicts.

187	Saturday, 03:30 PM - 05:00 PM, Houston (Floor 5)	<i>Track:</i> Supply Chain Management
	<i>Session:</i> Retail Operations	
	<i>Chair(s):</i> Olga Perdikaki	

025-0039 Shelf Loathing: Cross Docking at an Online Retailer
 Gilvan Souza, Associate Professor, Indiana University, United States
 Shengqi Ye, Student, Indiana University Bloomington, United States
 Kyle Cattani, Associate Professor, Indiana University, United States

We analyze trade-offs inherent in cross-docking transactions at an online retailer. Shelving and picking costs may be avoided by having the item moved directly from the receiving dock to the shipping dock, but if the order ships earlier than expected, customers may become less willing to pay for expedited shipping.

025-0098 Competition and Coordination in Online Marketplaces
 Jennifer Ryan, Associate Professor, Rensselaer Polytechnic Institute, United States
 Xuying Zhao, Assistant Professor, University Of Notre Dame, United States
 Daewon Sun, Assistant Professor, University Of Notre Dame, United States

Online market places, such as those operated by Amazon, eBay and Google, serve as an intermediary, providing the service of matching buyers with sellers, while control of the good is left to the seller. We study a new form of channel conflict caused by online marketplace systems.

025-0174 Store Location Decisions for Competing Retailers
 Dincer Konur, Student, University Of Memphis, United States

We analyze a manufacturer's store location problem for a set of competitive retailers, who may supply the market from these stores based on their operation costs. A method is proposed to determine the retailers' equilibrium decisions. It is then used to solve the manufacturer's store location problem.

025-0069 Risk Aversion, Inspection Error, and Inventory Record Inaccuracy
 Rogelio Oliva, Associate Professor, Texas A&M University College Station, United States
 Howard Hao-Chun Chuang, Student, Texas A&M University College Station, United States

We devise two optimization models to tackle inventory record inaccuracy (IRI) in retailing. Qualitative insights are derived from steady-state analytics assuming risk-neutrality and stochastic simulation under risk-aversion. Finally, we propose a hierarchical Bayesian model and use Markov chain Monte Carlo to make statistical inferences about unobserved human errors.

188	Saturday, 03:30 PM - 05:00 PM, Watertown (Floor 10)	<i>Track:</i> OM in Travel, Tourism, and Hospitality Industries
	<i>Session:</i> Lean Service Design in Travel and Tourism	
	<i>Chair(s):</i> Scott Sampson	

025-0480 Lean Service Design in Travel and Tourism
 Scott Sampson, Professor, Brigham Young University, United States

"Experiential service design" sounds cool but has limited market potential. An alternative is "lean service design," which I define as enhancing strategic interactions between providers and customers while automating, outsourcing, or eliminating non-strategic interactions. This workshop will review essential elements of lean service design, showing applications in travel and tourism.

189	Saturday, 03:30 PM - 05:00 PM, Ballroom F (Floor 5)	<i>Track:</i> Product Innovation and Technology Management
	<i>Session:</i> Meet the Editors	
	<i>Chair(s):</i> Sriram Narayanan Karthik Ramachandran	

025-1665 Meet the Editors
 Sriram Narayanan, Assistant Professor, Michigan State University, United States
 Karthik Ramachandran, Assistant Professor, Southern Methodist University, United States

Panel members: Thomas Choi, ASU, Editor Journal of Operations Management; Cheryl Gaimon, Georgia Tech, POM Journal, Management of Technology Dept Editor; Steve Graves, MIT, Editor M&SOM Journal; Asoo Vakharia, Univ. of Florida, Editor, Decision Sciences Journal.

190	Saturday, 03:30 PM - 05:00 PM, Los Angeles (Floor 5)	<i>Track:</i> Production Planning and Scheduling
	<i>Session:</i> Planning and Scheduling in Complex Systems I	
	<i>Chair(s):</i> Philipp Baumann	

025-1783 Managing Multiplant Production in Uncertain Environment
 Bharatendu Srivastava, Associate Professor, Marquette University, United States

In many recent surveys of supply chain professionals, demand volatility and poor forecast is by far one of the greatest challenges facing manufacturing companies. In this paper, we develop a mathematical programming approach for replanning production in a flexible multiplant environment with changing demand and cost structure.

025-1313 Estimating Resources and Minimizing Penalties under Volatile Demand in Lean Supply Chains
 Anthony Ross, Professor, University Of Wisconsin Milwaukee, United States
 Vaidy Jayaraman, Associate Professor, University Of Miami, United States
 Anurag Agarwal, Associate Professor, University Of South Florida, United States

In this paper we develop algorithms and a decision support system to estimate resource requirement under volatile demand in a lean and integrated supply chain environment. We also propose models for production scheduling based on partial deliveries to minimize penalties due to lateness. The models assume a flowshop environment.

025-1200 Large-scale short-term scheduling in make-and-pack production: case study and GA-based approach

Norbert Trautmann, Professor, University Of Bern, Switzerland
 Philipp Baumann, Student, University Of Bern, Switzerland

We consider the short-term scheduling of a complex industrial make-and-pack production process. The planning problem consists in minimizing the production makespan while meeting given product demands. We propose to combine a novel schedule-generation scheme with an evolutionary search strategy. Computational results show that this approach outperforms the state-of-the-art methods.

025-0569 Time and Space Two-sided Assembly Line Balancing Problem

Raghda Taha, Student, German University in Cairo, Egypt
 Amin El-Kharbotly, Professor, Faculty of Engineering, Ain Shams University, Egypt
 Nahid Afia, Associate Professor, Ain Shams University, Egypt
 Yomna Sadek, Student, Ain Shams University, Egypt

This paper considers the new problem of balancing the two-sided assembly lines under a cycle time constraint and a station space constraint. A Modified Genetic Algorithm is used to solve the problem with the objective of minimizing the number of stations as well as the number of mated-stations.

025-0574 Controlled Order Release (OR) in Two-Level Multi-Stage Job Shops: An Assessment by Simulation

Mark Stevenson, Lecturer, Lancaster University, United Kingdom
 Matthias Thurer, Student, Universidade Federal De São Carlos, Brazil
 Cristovao Silva, Associate Professor, Universidade de Coimbra, Portugal
 Martin Land, Associate Professor, University of Groningen, Netherlands
 Moacir Godinho Filho, Associate Professor, Universidade Federal De São Carlos, Brazil

OR research typically assumes products have simple structures. But, in practice, products are often complex and consist of several sub-assemblies. We evaluate the performance of OR in this context. We further assess when and where release control should be exercised. Results suggest that OR has the potential to improve overall performance.

191	Saturday, 03:30 PM - 05:00 PM, Northwestern (Floor 6) <i>Track:</i> Product Management
	<i>Session:</i> Pricing/Inventory Competition and Sales Force Management in Supply Chains
	<i>Chair(s):</i> Ming Hu

025-0437 Consignment Contracts with Retail Competition

Nantaporn Ratisoontorn, Student, University of Illinois - Chicago, United States
 Elodie Adida, Assistant Professor, University of Illinois at Chicago, United States

Under consignment contracts, items are sold at a retailer's but the supplier retains the full ownership of the inventory until purchased by consumers; the supplier collects payment from the retailer based on actual units sold. We investigate how competition among retailers influences the supply chain decisions under different contract terms.

025-1060 Multiple-Product Salesforce Assignment in a Stochastic Environment

Kai Luo, Student, University Of Toronto, Canada
 Joseph Milner, Associate Professor, University Of Toronto, Canada
 Opher Baron, Associate Professor, University Of Toronto, Canada

We consider a salesforce management problem where profit results from both commissions and bonuses. Sales of product per period are stochastic and dependent on the number and experience of salespeople assigned. We maximize the expected-revenue using dynamic-programming. We derive optimal and heuristic solutions to this problem, and discuss resulting managerial insights.

025-1064 Reorder Flexibility and Price Competition for Differentiated Products with Market Size Uncertainty

Philipp Afeche, Assistant Professor, University Of Toronto, Canada
 Ming Hu, Assistant Professor, University Of Toronto, Canada
 Yang Li, Student, University Of Toronto, Canada

We study a two-stage procurement-pricing problem faced by competing suppliers of seasonal products with uncertain market size. How many units to order, at a lower unit cost, prior to knowing the market size? Once the market size is known, how to price the product and how many units to reorder at a higher cost? We characterize equilibrium order/reorder and pricing strategies. We find that reorder flexibility may increase or hurt firms' profits and provide specific conditions for these outcomes.

192	Saturday, 03:30 PM - 05:00 PM, Ballroom C (Floor 5) <i>Track:</i> Healthcare Operations
	<i>Session:</i> CHOM's Best Paper Award Competition
	<i>Chair(s):</i> Vikram Tiwari

025-1794 An Examination of Differences in Treatment Quality for Trauma Patients Based on Hospital Arrival Time

David Anderson, Student, University Of Maryland, United States
 Guadong Gao, Assistant Professor, University Of Maryland, United States
 Bruce Golden, Professor, University Of Maryland, United States

We examine how hospital arrival time impacts treatment quality among trauma patients. Patients arriving at the hospital at night receive worse care than those arriving during daytime, measured by mortality rate, length of ICU stay, and surgical complication rate. The differences in care quality are more pronounced at smaller hospitals.

025-1015 Combating Malaria in Malawi: A Dynamic Approach to Pharmaceutical Distribution

Shervin Ahmadbeygi, Lead Analyst, Metron Aviation, United States
 Jonathan Helm, Student, University Of Michigan Ann Arbor, United States
 Mark Van Oyen, Associate Professor, University Of Michigan Ann Arbor, United States
 Hoda Parvin, Student, University Of Michigan Ann Arbor, United States
 Peter Larson, Student, University Of Michigan Ann Arbor, United States

Malaria is the primary cause of child mortality in Malawi, an underdeveloped African country. We present a stochastic optimization framework for the effective deployment of malaria medications within Malawi's constrained health budget. We design optimal transshipment strategies between regional clinics which reduce medical shortage costs by 25% without budget increases.

025-0042 The Underlying Economics Behind Physicians' Test-ordering Behavior in Outpatient Services

Mustafa Akan, Assistant Professor, Carnegie Mellon University, United States
Sridhar Tayur, Professor, Carnegie Mellon University, United States
Tinglong Dai, Student, Carnegie Mellon University, United States

Motivated by a collaborative study with a major ophthalmology clinic, we study physicians' test-ordering patterns when serving patients covered by insurance. We build a game theoretic queuing model and characterize the impacts of reimbursement ceiling, misdiagnosis concerns, patient heterogeneity, and physician type uncertainty.

025-0422 Health Care Supply Chain Design for Reducing Disparities: Resource Dependence and IT Leveraging

David Zepeda, Student, University Of Minnesota, United States
Kingshuk Sinha, Professor, University Of Minnesota, United States

Fundamental to health care supply chain management is the acknowledgement that not everyone enjoys the same opportunities to access quality care. Health IT is a critical component in reducing disparities. Using clinic level data this study evaluates the effects of resource dependence and IT leveraging competence in primary care settings.

193	Saturday, 03:30 PM - 05:00 PM, Kansas City (Floor 5) <i>Session:</i> Healthcare Modeling and Optimization I <i>Chair(s):</i> Steven Shechter	<i>Track:</i> Healthcare Operations
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025-0071 Pandemic Influenza Vaccine Allocation Protocol

Behzad Samii, Assistant Professor, Vlerick Management School, Belgium
Ann Vereecke, Professor, Vlerick Management School, Belgium

Health planners may exact-order, under-order, or over-order the vaccine inventory with respect to the expected demand. We develop service level expressions for high (target groups such as healthcare professionals) and low priority demand classes under the three main allocation mechanisms and determine the optimum mechanism for the given ordering policy.

025-1793 Operational Issues and Network Effects in Vaccine Markets

Elodie Adida, Assistant Professor, University of Illinois at Chicago, United States
Hamed Mamani, Assistant Professor, University Of Washington, United States
Debrabata Dey, Professor, University Of Washington, United States

Vaccines are the most effective means for preventing infectious diseases. However, network externalities on consumers and operational issues (such as yield uncertainty) do not provide the incentives required to reach the socially optimal vaccine coverage. We investigate how a socially optimal coverage can be induced through a two-part subsidy scheme.

025-0325 Dynamic Forecasting and Control Algorithms of Glaucoma Progression for Clinician Decision Support

Mariel Lavieri, Assistant Professor, University Of Michigan Ann Arbor, United States
Mark Van Oyen, Associate Professor, University Of Michigan Ann Arbor, United States
Joshua Stein, Assistant Professor, University Of Michigan Ann Arbor, United States
David Musch, Professor, University Of Michigan Ann Arbor, United States
Jonathan Helm, Student, University Of Michigan Ann Arbor, United States

Chronic illnesses affect nearly half of adults in the US. We develop dynamic state space disease prediction models combined with measures for likelihood of disease progression to determine testing frequency, or "time to next test" (TNT). Using data from clinical trials, we show TNT is more accurate with fewer tests.

025-0742 Screening Policies of Patients on the Kidney Transplant Waiting List

Tim Huh, Associate Professor, University Of British Columbia, Canada
Alireza Sabouri Bagh, Student, University Of British Columbia, Canada
Steven Shechter, Assistant Professor, University Of British Columbia, Canada

Transplant centers screen patients on the kidney transplant waiting list at various intervals to identify patients whose deteriorated health condition makes them no longer eligible for transplant. We provide a method for finding screening policies that improve both patient outcomes and the use of limited screening resources.

194	Saturday, 03:30 PM - 05:00 PM, Wisconsin (WI) (Floor 6) <i>Session:</i> Retail Operations VI <i>Chair(s):</i> Jan Fransoo	<i>Track:</i> Retail Operations
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025-0938 Integrating operational and financial decisions in retailing

Vishal Gaur, Associate Professor, Cornell University, United States

Recent research in operations management has sought to examine the role of financial markets in operational decisions as well as the implications of operational performance for the long term success of a firm. We examine this growing area with implications for future research.

025-1434 Learning Consumer Tastes through Dynamic Assortments

Canan Ulu, Assistant Professor, University Of Texas Austin, United States
Dorothee Honhon, Assistant Professor, Eindhoven University of Technology, Netherlands
Aydin Alptekinoglu, Assistant Professor, Southern Methodist University, United States

We study dynamic assortment decisions in a horizontally differentiated product category. In each period the firm offers an assortment and updates its subjective beliefs over consumer tastes in a Bayesian fashion. There is a tradeoff between immediate profits from sales (exploitation) and informational gains for future periods (exploration).

- 025-0965** The impact of the manager on store stockouts
 Daan Stam, Assistant Professor, Erasmus University Rotterdam, Netherlands
 Rene De Koster, Professor, Erasmus University Rotterdam, Netherlands

Inventory accuracy and stockouts are important issues for stores. We investigate for a large retail store chain whether the regulatory focus of the manager has an impact on procedures used in the store to maintain inventory integrity and on-shelf availability. Preliminary results show indeed an effect on store performance.

- 025-0741** Disappearing merchandise: An exploratory study of retail shrinkage and employee theft
 Gregory Curtis, Student, Mount Royal University, Canada
 Kalinga Jagoda, Associate Professor, Mount Royal University, Canada

Despite continuing effort by retailers, employee theft presents a significant challenge that affects profit margins and operations. This paper attempts to examine the relationship between inventory inaccuracy and employee theft and shoplifting in retail environment. Results indicate that both technological surveillance and human resources are required to control theft.

195	Saturday, 03:30 PM - 05:00 PM, River North (Floor 2)	<i>Track:</i> Vendor and Supply Contracts
	<i>Session:</i> Risk Management in Supplier Relationships	
	<i>Chair(s):</i> Burak Kazaz	

- 025-0371** Optimal Inventory Policies with Non-stationary Supply Disruptions and Advance Supply Information
 Bilge Atasoy, Student, Epfl, Switzerland
 Refik Gullu, Professor, Bogazici University, Turkey
 Tarkan Tan, Assistant Professor, Eindhoven University of Technology, Netherlands

We consider the inventory problem of a retailer under random supply availability. The supplier provides information on the future availability of the item. We provide exact characterization of the retailer order-up-to levels as a function of the advance supply information (ASI) and present managerial insight on the value of ASI.

- 025-0664** Joint Inventory and Pricing Decisions with Reference Effects
 Taner Bilgic, Professor, Bogazici University, Turkey
 Refik Gullu, Professor, Bogazici University, Turkey
 M. Guray Guler, Student, Bogazici University, Turkey

We analyze joint inventory and pricing problem of a single product whose stochastic demand is contingent on the current price and the price history which is captured by the reference price. We show the optimality of a state-dependent order-up-to policy for concave demand models and provide numerical studies.

- 025-0890** Production Planning under Supply and Quality Uncertainty with Two Customers Segments and Downward Substitution
 Tim Noparumpa, Student, Syracuse University, United States
 Burak Kazaz, Associate Professor, Syracuse University, United States
 Scott Webster, Professor, Syracuse University, United States

We examine the influence of downward substitution, pricing, and fruit-trading flexibilities on the firm's production decisions under supply and quality uncertainty. The firm obtains two grades of fruit to produce a high-end and a low-end product. We identify the conditions when high-quality fruit can be substituted for making low-end.

- 025-0571** Production Planning Problem in an Agricultural Supply Chain Under Yield and Quality Uncertainty
 Burak Kazaz, Associate Professor, Syracuse University, United States
 Scott Webster, Professor, Syracuse University, United States
 Nur Ayvaz, Reader, Syracuse University, United States

We consider the production planning problem in an agricultural supply chain with a single retailer and multiple farmers. There are two quality levels in the products, and two sources of uncertainty, in the yield and quality. We establish the rules of the best contracting scheme between two parties.

- 025-1677** Fairness in Selling to the Newsvendor
 Xiaole Wu, Assistant Professor, Fudan University, China
 Julie Niederhoff, Assistant Professor, Syracuse University, United States

We analyze the random-demand newsvendor model with fairness based objective functions for one or both parties. By reformulating the objective function and identifying extreme conditions, we characterize the impact of fairness concerns on supply chain efficiency and profit allocations.

196	Saturday, 03:30 PM - 05:00 PM, Cook (Floor 3)	<i>Track:</i> OM in China/East Asia
	<i>Session:</i> Inventory Models	
	<i>Chair(s):</i> Frank Chen	

- 025-0230** Analysis of Supply Contracts with Total Minimum Quantity Commitment and Fixed Order Costs
 Frank Chen, Associate Professor, The Chinese University Of Hong Kong, China
 Quan Yuan, Student, Chinese Univ Of Hong Kong, China

We study a supply contract that specifies a minimum total (cumulative) order quantity over the planning horizon (e.g., one year). Each replenishment order incurs both fixed and variable costs. Introducing a new class of K-convex functions, we show the optimal policy to be of a modified (s, S) form.

- 025-0780** An Exact Performance Evaluation of (r, Q) Policies for Multi-echelon Inventory Systems
 Ming Hu, Assistant Professor, University Of Toronto, Canada
 Yi Yang, Student, The Chinese University Of Hong Kong, China

We consider the classical two-stage serial inventory system with Poisson demands and with fixed ordering costs and positive lead-times at both stages. Under mild assumptions, we show that there exist efficiently-computable (r, Q) policies which are at least 1.25-optimal. We make extensions to the multi-stage case.

025-1304 Analysis of the Environmental Impact of a Green Product on the Supply Chain Operations

Jianjun Xu, Postdoc, Zaragoza Logistics Center, Spain
 Youyi Feng, Professor, Zaragoza Logistics Center, Spain

We establish an inventory management model under periodic review to analyze the environmental effect of designing a green product on the supply chain performance. In conjunction with ETS, and the cap and trade framework, the firm can minimize its cost by dynamically optimizing its production and carbon credit trade decisions.

025-1190 Dynamic Inventory Replenishment and Pricing for Substitutable Apparel Products with Demand Learning

Junjun Gao, Associate Professor, SILC, China

The impact of demand learning and demand substitution on inventory management and pricing of apparel products with short selling seasons for an apparel supply chain is studied. A joint decision model of dynamic inventory replenishment and pricing is established with demand learning and demand substitution.

197	Saturday, 03:30 PM - 05:00 PM, Ballroom G (Floor 5) <i>Session:</i> Topics in Service Operations <i>Chair(s):</i> Vasiliki Kostami	<i>Track:</i> Service Operations
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025-0382 Skill and Capacity Management in Large-scale Service Marketplaces

Gad Allon, Associate Professor, Northwestern University, United States
 Achal Bassamboo, Associate Professor, Northwestern University, United States
 Eren Cil, Assistant Professor, University Of Oregon, United States

We consider a large-scale marketplace where service providers have multiple skills. We show that when agents' skills are independent, the firm moderating the marketplace may need to refuse some of the candidate service providers via its skill tests whereas this is never optimal when agents' skills are perfectly correlated.

025-0583 Overflow Networks: Approximations and Implications to Call Center Outsourcing

Itai Gurvich, Assistant Professor, Northwestern University, United States
 Ohad Perry, Assistant Professor, Northwestern University, United States

Motivated by call-center outsourcing problems, we consider a network with multiple call centers overflowing some of their calls to a central call center. We provide approximations and prove an asymptotic-independence result which facilitates the solution of call-center coordination problems.

025-0755 Appointment Scheduling under No-shows and Customer Preferences

Jacob Feldman, Student, Cornell University, United States
 Huseyin Topaloglu, Associate Professor, Cornell University, United States
 Nan Liu, Assistant Professor, Columbia University, United States
 Serhan Ziya, Associate Professor, University Of North Carolina Chapel Hill, United States

We consider a service system that works with appointments. Each arriving customer chooses a day from a set offered by the service provider. We develop a model and solution methods to determine which days to offer to the customer so as to maximize the provider's long-run average revenue.

025-1279 Employee Retention and Job Assignment Strategies of Entrepreneurial Firms

Dharma Kwon, Assistant Professor, University Of Illinois Urbana-Champaign, United States
 Onesun Yoo, Assistant Professor, University College London, United Kingdom

We study the employee retention and job assignment strategy of growth-oriented entrepreneurial firms in which the employee's capability is unknown to both the firm and the employee. Our results suggest that firms should assign employees with highly uncertain capabilities to tasks with high noise levels.

198	Saturday, 03:30 PM - 05:00 PM, Miami (Floor 5) <i>Session:</i> Sustainability and Capacity Management <i>Chair(s):</i> Baris Ata Ozge Islegen	<i>Track:</i> Capacity Management
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025-1514 The Effect of Variability in Climate Policy on Facility Location and International Trade

Erica Plambeck, Professor, Stanford University, United States
 Terry Taylor, Associate Professor, University Of California Berkeley, United States
 Ozge Islegen, Assistant Professor, Northwestern University, United States

One region imposes a tax on GHG emissions or a cap-and-trade system in which the cost of emission permits is uncertain. We show how variability in the permit cost affects manufacturers' decisions about facility location, the "leakage" of emissions, trade quantities, and social welfare in the region with climate policy.

025-0536 How to Allocate Recycling Costs to Producers: Individual or Collective Producer Responsibility?

Hyoduk Shin, Assistant Professor, Northwestern University, United States
 Jingqi Wang, Student, Northwestern University, United States

We compare two categories within extended producer responsibility (EPR): individual producer responsibility (IPR) and collective producer responsibility (CPR). We investigate the impact of technology sharing on this comparison and show that if technology sharing is considered, then CPR can be better than IPR in all aspect in a competitive industry.

025-1343 Got Local Food?

Deishin Lee, Assistant Professor, Harvard University, United States
 Baris Ata, Associate Professor, Northwestern University, United States
 Mustafa Tongarlak, Student, Northwestern University, United States

We study the operational tradeoffs of a retailer and farmers in a fresh-produce supply chain to determine the equilibrium supply chain structure. We show the reasons why economies-of-scale model of production, distribution, and retailing in fresh-produce supply is dominant, and quantify how backhauling and vertical differentiation increase local farmers' competitiveness.

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Saturday, 03:30 PM - 05:00 PM, Minnesota (MN) (Floor 6) *Track:* Inventory Management
Session: Inventory Management for Socially-Responsible Operations
Chair(s): Feryal Erhun

025-1640 Improving access to community-based chronic care through improved capacity allocation

Karen Smilowitz, Associate Professor, Northwestern University, United States
Sarang Deo, Assistant Professor, Indian School Of Business, India
Seyed Iravani, Professor, Northwestern University, United States
Tingting Jiang, Student, Northwestern University, United States

We study a model of community-based healthcare for chronic diseases. Patients periodically access the healthcare system, influencing their disease progression and health outcomes. The provider's goal is to maximize community-wide health outcomes, subject to capacity constraint. We investigate how the provider can improve her objective through better operational decisions.

025-1745 On Hospice Operations under Medicare Reimbursement Policies

Rodney Parker, Associate Professor, University Of Chicago, United States
Baris Ata, Associate Professor, Northwestern University, United States
Tava Olsen, Professor, University Of Auckland, New Zealand

We analyze the United States Medicare hospice reimbursement policy, which consists of a daily payment and cap. We show numerous unintended consequences relating to recruiting and live-discharging of patients as well as effects upon the hospice's financial health. We propose some remedies to ameliorate these problems.

025-1479 Pricing and Inventory Management of Perishable Goods with Two Periods of Shelf Life

Georg Schorpp, Student, Stanford University, United States
Feryal Erhun, Assistant Professor, Stanford University, United States

Inventory management for platelets is a challenging task due to an extremely short product life cycle, a high unit production cost, a limited pool of platelet donors, and a high demand uncertainty. We study a supplier's pricing and a buyer's inventory decisions for a perishable product such as a platelet.

Sessions for Sunday, April 22

Sunday, 08:00 AM - 09:30 AM

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Sunday, 08:00 AM - 09:30 AM, Scottsdale (Floor 5)

Track: Behavioral Operations

Session: Human Behavior and Organizational Behavior in Operations Management

Chair(s): Pauline Found

025-0877 Fostering Buyer-Supplier Integration: The Supply Chain Executive's Role under Top Management Pressure

Luis Gomez-Mejia, Professor, Texas A&M University College Station, United States

Elena Revilla, Professor, IE Universidad, Spain

Guanyi Lu, Student, Texas A&M University College Station, United States

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

Using matched-pair survey and objective data from 133 firms, we test (i) how top management team's ambition to set challenging goals increases supply chain executives' perceived risks, thereby reducing their involvement in promoting high-return, albeit risky buyer-supplier integration and (ii) how the importance of SCM can shape the proposed relationships.

025-0598 Customer Complaint Behavior in the Indian Airline Industry: An Exploratory Study

Ashu Sharma, Student, JK Lakshmipat University, India

Sandeep Joshi, Supervisor, Jet Airways, India

Present study aims at timely capturing of customers complaints and emphasizes quick resolution. The Need- Gap analysis determines deviations between actual and expected quality and taking corrective action. Analysis indicates the presence of multi-dimensional aspects regarding complaining behavior. Critical analysis of results helps to evolve service strategies in response to customer needs.

025-1491 Buyer-Supplier relationships: the human behavior influence in value creation and appropriation

Janaina Siegler, Student, Fundacao Getulio Vargas, Brazil

Luiz Brito, Professor, Fundacao Getulio Vargas, Brazil

This study intends to analyze how the individual human behavior influences in generation and value appropriation and what are their impacts in supply chain management, considering the premise of bounded rationality. We propose a multi-theoretical (TCT, RV and SET) and multi-methods approach (case studies and human experiments).

025-0234 The Connection Between Organizational Learning and Lean Production

Pauline Found, Retired, Cardiff University, United Kingdom

Qing Hu, Student, Cardiff University, United Kingdom

Sharon Williams, Lecturer, Cardiff University, United Kingdom

Robert Mason, Senior Lecturer, Cardiff University, United Kingdom

By reviewing literature of organizational learning and lean production, the paper discusses the potential connection between these two concepts in terms of the opportunities for researchers and practitioners to, firstly, operationalize the ideas of organizational through lean production and, secondly, to achieve continuous improvement of lean production through organizational learning.

025-0971 Changing Organisational Behaviours in Lean Transformation

Pauline Found, Retired, Cardiff University, United Kingdom

Babatunde Banjo, Student, Cardiff University, United Kingdom

One of the major challenges of organisations facing employing lean manufacturing practices is defining the behavioural landscape necessary to sustain lean-based operations, and devising appropriate change management mechanisms to reach this state. This study examines the efficacy of adopting a two-phase transformational strategy in driving systematic behavioural changes.

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Sunday, 08:00 AM - 09:30 AM, Lincolnshire II (Floor 6)

Track: OM and Economic Models

Session: Modeling Consumer Behavior in Service Operations

Chair(s): Gad Allon Zeynep Aksin

025-0403 Bounded Rationality in Service Systems

Achal Bassamboo, Associate Professor, Northwestern University, United States

Gad Allon, Associate Professor, Northwestern University, United States

The traditional economics and queuing literature typically assume that customers are fully rational. In contrast, in this paper, we study canonical service models with boundedly rational customers. We capture bounded rationality using a framework in which customers are not capable of accurately estimating waiting times.

025-1387 Consumer Response to Price Changes in Gasoline Retail

Margaret Pierson, Retired, Harvard Business School, United States

In gasoline retail, a significant fraction of consumer transactions are clustered at "bill-values", e.g., \$20. Although aggregate U.S. demand volume is relatively stable, this clustering reduces per-transaction volumes as prices increase. Using transactional panel data this study examines the transaction-level consumer response to price changes.

025-1423 Quality Conscious Strategic Customers in Queues

Zeynep Aksin, Professor, Koc University, Turkey

Fikri Karaesmen, Professor, Koc University, Turkey

Gorkem Sariyer, Student, Koc University, Turkey

We study stylized queueing models with strategic customers, where customers are not only concerned about the wait but also about the subsequent service they will receive. Different organizational forms for the recovery from service failure are analyzed, and their performance under the socially optimal and individual customer decisions is compared.

025-1435 Joining (and leaving) observable and unobservable queues - An experimental investigation

Laurens Debo, Associate Professor, University Of Chicago, United States
Mirko Kremer, Assistant Professor, Penn State University State College, United States

We report results from a laboratory experiment designed to test some of the key predictions of queuing theory. Specifically, we investigate how customers form waiting time expectations and how they make joining decisions, when the current congestion level is (or is not) observable upon arrival to the service facility.

203	Sunday, 08:00 AM - 09:30 AM, Ohio State (Floor 6) <i>Session:</i> Supply Chain Contracts II <i>Chair(s):</i> Kevin Li Peng Ma	<i>Track:</i> Vendor and Supply Contracts
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025-0919 Vulnerability Measurement of Supply Chain Networks from Topology Perspective

Lindu Zhao, Professor, Southeast University, China
Michael Herty, Professor, Rwth Aachen University, Germany
Xinping Wang, Student, Southeast University, China

This paper studies vulnerability measurements for supply chain networks. A continuous network model for supply chains is established and metrics that can quantify the vulnerability are proposed from topology perspective. Suggestions to increase vigilance against risks of critical nodes and paths in the network are stated based on these metrics.

025-0808 Coordinating a two-stage supply chain with stock-and price-dependent demand

Haiyan Wang, Professor, Southeast University, China
Peng Ma, Student, Southeast University, China

We consider a two-stage supply chain consisting of a supplier and a retailer with stock-and price-dependent random demand. We consider the PO contract as a benchmark case, and then consider the RS contract. We investigate the impact of price-sensitivity factors and stock-dependent values on the RS contract and channel performance.

025-0659 Futures Market Trading, Productivity Improvement and Supply Chain Operations

Debing Ni, Professor, University of Electronic Science and Technology of China, China
Xiaowo Tang, Professor, University of Electronic Science and Technology of China, China
Kevin Li, Associate Professor, University of Windsor, Canada

A two-echelon supply chain with a supplier and a manufacturer is investigated. The two firms maintain a direct bilateral relation through a wholesale price contract and may also trade through a futures market. A three-stage game model is established to examine the supply chain operations with the dual trading channels.

204	Sunday, 08:00 AM - 09:30 AM, Purdue (Floor 6) <i>Session:</i> Strategic Customer Behavior <i>Chair(s):</i> Ehsan Elahi	<i>Track:</i> Marketing and OM Interface
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025-0776 Dynamic pricing under demand uncertainty in the presence of strategic consumers

Benny Mantin, Assistant Professor, University Of Waterloo, Canada
Yinhan Meng, Student, University Of Waterloo, Canada

We study a retailer's pricing, inventory decisions, and inventory release policies when faced with uncertain demand and strategic consumers. We characterize the inventory release policy and find that if inventory is released to clear the market, then the presence of strategic consumers may be beneficial for the retailer.

025-1604 The Hidden Benefit of Cross Selling and Price Bundling

Amit Eynan, Professor, University Of Richmond, United States
Eitan Gerstner, Professor, Technion Israel Institute Of Technology, Israel

Cross-Selling and Price-Bundling are known to extract consumers' surplus and increase sales. We show that beyond these familiar demand-side advantages these techniques also have significant cost-side advantages by reducing inventory risks associated with product demand uncertainty. This explains why retailers don't wait for end-of-season to cross-sell products at rock-bottom prices.

025-1120 The Interaction of Quality, Warranty, and Brand Reputation

Kunpeng Li, Assistant Professor, Sam Houston State University, United States
Suman Mallik, Associate Professor, University of Kansas, United States
Dilip Chhajed, Professor, University of Illinois at Urbana-Champaign, United States

We study the interaction between warranty, brand reputation, and product quality, when product quality is unobservable to consumers. Heterogeneous consumers perceive quality signals from the producer, form quality beliefs, and make purchase decisions. We examine the producer's optimal quality-signaling strategies under various scenarios.

025-1187 Managing Successive Generation Product Diffusion in the Presence of Strategic Consumers

Zhiling Guo, Assistant Professor, City University Of Hong Kong, China

Frequent new product release and technological uncertainty about the release time pose significant challenges for firms to manage successive generation of products. This study proposes a prediction market mechanism to forecast new product release. Better forecasting helps both the firm and strategic consumers to make optimal pricing and purchase decisions.

025-1574 Product Bundling: The Impacts of Demand Uncertainty and Value Heterogeneity

Mehdi Sheikhzadeh, Assistant Professor, Sharif University Of Technology, Iran (Islamic Republic of)
Ehsan Elahi, Assistant Professor, University Of Massachusetts Boston, United States

In this research we investigate the impact of heterogeneity in the cost and demand of the two bundled product on the value of product bundling vs. offering the products separately. We compare these results for three types of products: substitutable products, complementary products and independent products.

205	Sunday, 08:00 AM - 09:30 AM, Great America II (Floor 6) <i>Track:</i> OM Practice
	<i>Session:</i> Sustainable Operations
	<i>Chair(s):</i> Tharanga Rajapakshe

025-0054 Green Attributes and Product Design/Introduction Decisions

Arda Yenipazarli, Student, UF, United States
 Asoo Vakharia, Professor, UF, United States

In this research, we focus on the whether a firm should choose to expand its current portfolio of product offerings to include an environmentally "friendly" product which integrates multiple green attributes.

025-0418 Process Innovation via an Industrial Symbiotic System: Impact of Competition on the Willingness to Implement

Yunxia Zhu, Student, University Of Texas Dallas, United States
 Milind Dawande, Professor, University Of Texas Dallas, United States
 Srinagesh Gavirneni, Associate Professor, Cornell University, United States
 Vaidy Jayaraman, Associate Professor, University Of Miami, United States

Inspired by a real-world example of a paper-sugar symbiotic complex, we study the impact on a firm's operational decisions from implementing an industrial symbiotic system. Our focus is on understanding how the introduction of competition and nature of competition will affect the firm's "willingness" to implement the symbiotic system.

025-1332 Regulating Markets for Valuable Waste: Cherry Pickers vs. Scavengers

Atalay Atasu, Assistant Professor, Georgia Institute Of Technology, United States
 Luk Van Wassenhove, Professor, INSEAD, France
 Gokce Esenduran, Assistant Professor, Ohio State University, United States

Take-back legislation mandates minimum recovery rates for waste products. The recoverable value in waste products may create competition between producer and scavenger and divert them from landfills even under no legislation. We identify the conditions where legislator should not distort an efficient waste market by imposing recovery targets.

025-1461 A Stochastic Inventory Model for Remanufacturable Parts

Sila Cetinkaya, Professor, Texas A&M University College Station, United States
 Ibrahim Karakayali, Scientific Consultant, Management, Analysis & Consulting, United States
 Elif Akcali, Associate Professor, University Of Florida, United States

Remanufactured parts are often used as replacement parts for warranty repairs. Hence, seed stock quantities of replacement parts are critical to ensure that sufficient amounts are remanufactured to cover the demand. We develop a stochastic multi-period inventory model for planning and optimization in this context.

025-1629 Remanufacturing Strategies for a Technology Product with Lost Sales

Justin Jia, Assistant Professor, Purdue University, United States
 Susan Xu, Professor, Penn State University University Park, United States
 Daniel Guide, Professor, Penn State University University Park, United States

We investigate remanufacturing systems for a technology product with lost sales, capturing key characteristics: short lifetime, mismatched supply and demand, heterogeneous qualities of returned products, and eroding salvage and resale values of products. We derive optimal and myopic policies for efficiently utilizing regular production and expedited production in remanufacturing.

206	Sunday, 08:00 AM - 09:30 AM, Dupage (Floor 3) <i>Track:</i> Scheduling and Logistics
	<i>Session:</i> Contemporary topics in scheduling and logistics
	<i>Chair(s):</i> Chi-to Ng

025-0435 Appointment Scheduling in Offline and Online Settings

Michael Pinedo, Professor, New York University, United States
 Christos Zacharias, Student, New York University, United States

We consider a fixed number of timeslots. Customers with different weights have to be assigned to the slots. Each customer has a probability of not showing up. We analyze priority rules that minimize the total expected waiting cost of the customers in an offline and in an online setting.

025-1192 Shippers' Cooperation in Inventory Replenishment and Shipment Consolidation by Terminals

Xiaoqiang Cai, Professor, The Chinese University Of Hong Kong, Hong Kong
 Minghui Lai, Student, The Chinese University Of Hong Kong, Hong Kong

We study cooperative games where shippers consolidate shipments by terminals. If the shippers only share transportation cost, the game is balanced. If they agree to have the same replenishment frequency and share both replenishment cost and transportation cost, the game is balanced under a sufficient condition.

025-1206 Flexible Capacity Strategy with Multiple Periods under Demand Uncertainty and Investment Constraints

Chi-to Ng, Associate Professor, The Hong Kong Polytechnic University, Hong Kong
 Liu Yang, Assistant Professor, University Of International Business And Economics, China

We establish a flexible capacity strategy model with multiple market periods under demand uncertainty and investment constraints. We solve the optimal total production, the optimal additional production and the optimal sales under different situations. We find that there are two thresholds of the unit capacity cost.

207	Sunday, 08:00 AM - 09:30 AM, Ballroom A (Floor 5) <i>Track:</i> Sustainable Operations
	<i>Session:</i> Sustainable Technology, and Safety
	<i>Chair(s):</i> Sam Aflaki

025-0983 Strategic Investment in Renewable Energy Sources

Sam Aflaki, Assistant Professor, Hec Montreal, France
Serguei Netessine, Emeritus Professor, INSEAD, France

We model the tradeoffs between investing in an intermittent renewable technology (such as wind) and a non-renewable technology, which is also non-intermittent (such as natural gas). We examine the impact of different cost structures and carbon taxes on the share of the renewable capacity in the total electricity generation portfolio.

025-1565 Announcement of Negative Workplace Safety Event: Examining the Effect on Firm Performance

Theekshana Somaratna, Student, Iowa State University, United States
Qazi Kabir, Student, Iowa State University, United States
Kevin Watson, Assistant Professor, Iowa State University, United States

Operations management literature is quite sparse on the issue of workplace safety. However, workplace safety can significantly affect the performance of a firm in multiple ways. This paper explores the implications of workplace safety using an event study method. In addition, the paper makes some suggestions on workplace safety improvement.

025-1099 Consumer Rebates for Green Technology Adoption

Ruben Lobel, Assistant Professor, The Wharton School, University of Pennsylvania, United States
Maxime Cohen, Student, Massachusetts Institute Of Technology, United States
Georgia Perakis, Professor, Massachusetts Institute Of Technology, United States

We study the problem of designing consumer subsidies for adopting green technology. The government sets subsidies to achieve an adoption target level while minimizing its cost, whereas industry optimizes profit. We explain how demand uncertainty will affect the subsidy level and overall welfare of the system.

208	Sunday, 08:00 AM - 09:30 AM, Denver (Floor 5)	<i>Track:</i> Sustainable Operations
	<i>Session:</i> Sustainable Development, Market Performance & Environmental Reporting	
	<i>Chair(s):</i> Petros Christofi	

025-1048 Planning for sustainable development: The Impact of firm size on operations strategy and operational performance

Amanda Edge, Student, Mount Royal University, Canada
Kalinga Jagoda, Associate Professor, Mount Royal University, Canada

This paper explores the effect of firm size in formulating operation strategies for sustainable development of firms in the Canadian resources sector. Using data collected from oil and gas firms, it proposes a new framework to represent economic and environmental alignment in a way that multiple strategies can be integrated.

025-1083 Sustainable Market Indexes Behavior Analysis: A Study on the Brazilian Stock Market

Luiz Veiga, Student, Pontifical Catholic University Of Parana, Brazil
Ubiratan Tortato, Assistant Professor, Pontifical Catholic University Of Parana, Brazil
Wesley da Silva, Professor, Pontificia Universidade Católica do Paraná, Brazil

Aiming to evaluate return and risk on Socially Responsible Investments, this paper evidenced there is no significant divergence between the returns of sustainable and conventional market indexes in Brazilian Stock Market. Despite the differences found for the risk indicator, it is suggested that it is not related to sustainable recognition.

025-1086 Effectiveness of Operations Sustainability Strategies: The Role of Organizational Practices

Raffaella Cagliano, Professor, Politecnico Di Milano, Italy
Annachiara Longoni, Student, Politecnico Di Milano, Italy

Eleven cases in the food industry highlight the relevant and differentiated role of bottom-up (training, involvement, bi-directional communications) and top-down (cross-functional teams, top management commitment, incentives) organizational practices in the definition and implementation of effective operations sustainability strategies and in the optimization of trade-offs between environmental, social and economical performance.

025-1153 Corporate Sustainability Reporting Practices

Andreas Christofi, Associate Professor, Monmouth University, United States
Seleshi Sisaye, Professor, Duquesne University, United States
Petros Christofi, Associate Professor, Duquesne University, United States

Sustainability Reporting evolved in the mid 1990's to manage and balance company productive efforts with those of the environment and their surrounding communities. It has been suggested that a company's strategy, management and performance with regard to the environmental and social challenges can be reported alongside its economic performance.

209	Sunday, 08:00 AM - 09:30 AM, Ballroom H (Floor 5)	<i>Track:</i> Teaching in OM
	<i>Session:</i> Teaching OM using Games and Simulations	
	<i>Chair(s):</i> Gal Raz	

025-0048 Teaching OM Using Games and Simulations

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

Creative, participatory teaching techniques are important tools in every teaching environment. This tutorial explores the use of hands-on games and simulations in teaching OM. We begin with an overview of how simulations can be included in the curriculum and continue with specific examples for teaching SCM and Lean.

210	Sunday, 08:00 AM - 09:30 AM, Illinois (IL) (Floor 6)	<i>Track:</i> General Track
	<i>Session:</i> Optimization & Simulation of Operations and IT Capabilities	
	<i>Chair(s):</i> John Wilson	

025-0070 The role of market growth strategy, formal controls, and training programs in building IT capabilities

Stephen Callaway, Assistant Professor, University Of Toledo, United States

David Dobrzykowski, Assistant Professor, Eastern Michigan University, United States

This paper examines how market growth strategy affects knowledge management (KM) processes (namely formal controls versus employee-centered training programs) aimed at translating information into usable knowledge, thus driving the development of IT capabilities. SEM results from a sample of FDIC-registered banks reveal important relationships of interest to managers and researchers.

025-1618 Using Simulation Optimization with Bayesian Updates for Unmanned Aerial System Design

Sharif Melouk, Assistant Professor, University Of Alabama Tuscaloosa, United States

Belleh Fontem, Student, University Of Alabama Tuscaloosa, United States

Unmanned aerial systems (UASs) are used in missions to identify and pursue targets in challenging environments. We employ a new Bayesian updating policy to investigate the proper design configuration of a UAS fleet to maximize mission effectiveness. We experiment with varying mission conditions and offer decision-making insights.

025-1653 Cost Optimization of Imperfect Non-Periodic Inspections in a Delay-Time Model

Ji Ye Janet Sung, Student, University Of Toronto, Canada

When a defect occurs in an asset, it may transition into a failure over time, known as delay time. We will develop a model to minimize the total cost of the maintenance policy including expected cost of failures, cost of inspection and expected cost of preventive maintenance.

025-1564 On the Optimality of Coupon Books

John Wilson, Professor, Ivey School of Business, Canada

Jing Chen, Assistant Professor, University of Winnipeg Faculty of Business and Economics, Canada

Coupon books supply a fixed number of products for a fixed total price. Offering coupons will be shown to be optimal if and only if a precise relationship holds between market share and the ratios of a company's usual product price to that of its competitors.

211	Sunday, 08:00 AM - 09:30 AM, Ballroom B (Floor 5)	<i>Track:</i> Supply Chain Management
	<i>Session:</i> Supply Chain Governance	
	<i>Chair(s):</i> Sriram Narayanan	

025-0847 Effective governance mechanisms in the presence of opportunism and uncertainty in strategic outsourcing

Ravi Srinivasan, Instructor, Michigan State University, United States

Ram Narasimhan, Professor, Michigan State University, United States

Using fit as profile deviation, the effective configurations of governance mechanisms are explored. The governance mechanisms are broadly defined into two groups - transactional governance mechanisms and relational governance mechanisms. The results indicate that relational governance mechanisms are effective in achieving superior outsourcing performance

025-0876 ISO 9000 Certification and Process Compliance: Short Term and Long Term Results

John Gray, Assistant Professor, Ohio State University, United States

Aleda Roth, Professor, Clemson University, United States

Gopesh Anand, Assistant Professor, University Of Illinois Urbana-Champaign, United States

This research examines the effects of obtaining ISO 9000 certification on process compliance among medical device manufacturers in the US. Using 13 years of data obtained from the FDA, and pairing plants that obtained certification with similar plants that did not, we compare average compliance levels after certification.

025-0929 Make or Contract? The Role of Cost, Quality and Behavioral Uncertainty

David Hall, Student, Clemson University, United States

Johnny Rungtusanatham, Professor, Ohio State University, United States

Aleda Roth, Professor, Clemson University, United States

Using experimental data collected from 269 managers, we examine tension between acquiring cost and quality capabilities and the contract manufacturer's behavioral uncertainty on the decision to make or contract. We test predictions from the resource-based view, transaction cost economics and competitive progression theory.

025-1169 Contract choice, supplier characteristics and outsourcing performance

Ram Narasimhan, Professor, Michigan State University, United States

Sriram Narayanan, Assistant Professor, Michigan State University, United States

We examine the effect of contract choice on outsourcing performance. We show that the impact of contract choice on outsourcing performance is contingent on key supplier characteristics that include supplier human capital, supplier flexibility and supplier importance. We account for endogeneity of contract choice.

212	Sunday, 08:00 AM - 09:30 AM, Houston (Floor 5)	<i>Track:</i> Supply Chain Management
	<i>Session:</i> Service Supply Chains	
	<i>Chair(s):</i> Felix Friemann	

025-0562 Selection of service supply chain value creating perspective using AHP approach

Parikshit Charan, Assistant Professor, IIM Rohtak, India

Arpita Khare, Assistant Professor, Indian Institute of Management Rohtak, India

Jitendra Madaan, Assistant Professor, Indian Institute Of Technology Roorkee, India

Analytic hierarchy process (AHP) based decision model presented in this paper structures the problem related to selection of service supply chain value creating perspective in a hierarchical form with alternatives available to the decision maker. The final outcome of the AHP is an optimum service supply chain value creating perspective.

025-1213 Spare parts inventory control for an aircraft component repair shop

Willem van Jaarsveld, Student, Erasmus University Rotterdam, Netherlands

Twan Dollevoet, Student, Erasmus University Rotterdam, Netherlands

We study spare parts inventory control at an aircraft component repair shop. Parts are used in multiple component types. Each component type has an availability target. We develop an algorithm to optimize inventory policies at the repair shop. Unlike existing algorithms, it can handle the large scale of the problem.

025-0566 Solid waste recovery supply chain networks - Structure and Operations

Chandiran Palaniappan, Associate Professor, Loyola Institute of Business Administration, India

Ramasubramaniam Muthurathnasabapathy, Assistant Professor, Loyola Institute of Business Administration, India

In India, the recycling network is loosely netted with group of waste pickers, junk dealers, wholesalers and recyclers, especially waste pickers. This paper provide a comprehensive analysis of this supply chain in terms of its structure, price dynamics, volume of materials moved and its contribution to economic activity

025-1212 Best Practices for Supply Chain Management Techniques and Concepts across Industries

Stephan Verhasselt, Student, Eth Zurich, Switzerland

Felix Friemann, Student, Eth Zurich, Switzerland

Due to diverse boundary conditions and requirements across industries, structures and processes of supply chains vary considerably between different industries. This paper summarizes the results of an interview-based survey with supply chain management experts from different industry sectors indicating best practices for supply chain management techniques and concepts across industries.

213	Sunday, 08:00 AM - 09:30 AM, Watertower (Floor 10)	<i>Track:</i> OM in India/SE Asia
	<i>Session:</i> Service & Manufacturing Practices in India/SE Asia	
	<i>Chair(s):</i> Jitendra Madaan	

025-0607 Dynamic Analysis of Sustainable Factors for Improving Performance of Product Recovery System

Jitendra Madaan, Assistant Professor, Indian Institute Of Technology Roorkee, India

Sachin Mangla, Student, Indian Institute Of Technology Roorkee, India

Towards implementing an efficient product recovery system reprocessing technologies and capacity planning policies represents major opportunities for improvement. Dynamic decision for sustainable capacity expansion confirming product return quantity and quality can improve performance of an enterprise involved in product returns. With an accurate capacity requirement one can determine how much reprocessing may be needed. Therefore system modeling and characterization is required. This paper analyzes current models on product return networks and develops a system dynamics model to facilitate basic return system with a aim demonstrate the economic advantage both for upcoming as well for enterprise to be involved in product recover.

025-1201 Investigation on factors influencing performance measurement system adoption by Service SMEs in Brunei

Masairol Haji Masri, Student, University Of Manchester, United Kingdom

Objective of the paper is to investigate the influence of corporate governance; human capital; information technology; management style; organizational culture and organization strategy on different development levels of PMS among the service SMEs in Brunei. Questionnaire technique was used. ANOVA indicate significant differences between the three clusters of SMEs investigated.

025-0612 Drivers of supply chain integration and the role of organizational culture: Empirical evidence from Indonesia

Suresh Tadisina, Professor, Southern Illinois University Carbondale, United States

Erlinda Yunus, Student, Southern Illinois University Carbondale, United States

This study examines the relationships between supply chain integration, firms' internal and external drivers, and firm performance. This study further investigates the moderating role of organizational culture in strengthening or weakening the relationships. A survey of Indonesian manufacturers was conducted to test the main and moderating effects.

025-1184 Performance Measurement System in Brunei Darussalam Service Sector Small and Medium Enterprises (SMEs)

Masairol Haji Masri, Student, University Of Manchester, United Kingdom

Objective of the paper is to establish a pattern of PMS use by service SMEs in Brunei by examining the current practices using six principles of 'best practices' questionnaire technique. Cluster analysis show that more than 50% respondents use a balance PMS and only 16% are currently adopting traditional methods.

025-0826 Empirical Study on Implementation of Kaizen Practices in Vietnamese Manufacturing Companies

Anh Phan, Lecturer, University of Economics and Business, Vietnam National University, Hanoi, Vietnam

Minh Nguyen, Lecturer, University of Economics and Business, Vietnam National University, Hanoi, Vietnam

Yoshiki Matsui, Professor, Yokohama National University, Japan

This study examines the transferability of Kaizen practices in Vietnam using the data collected from 64 manufacturing companies. The results indicate that the implementation of Kaizen practices significantly associate with quality performance and the successful Kaizen implementation strongly depend on contextual factors such as organizational structure and culture.

214	Sunday, 08:00 AM - 09:30 AM, Ballroom F (Floor 5)	<i>Track:</i> Product Innovation and Technology Management
	<i>Session:</i> Knowledge Management and Distributed Innovation	
	<i>Chair(s):</i> Aravind Chandrasekaran	

025-0374 The Manufacturing Quality Implications of Collocating R&D and Manufacturing in the Pharmaceutical Industry

Enno Siemsen, Assistant Professor, University Of Minnesota, United States

Gurneeta Vasudeva, Assistant Professor, University Of Minnesota, United States

John Gray, Assistant Professor, Ohio State University, United States

In this paper, we examine whether and when collocating R&D and manufacturing affects manufacturing quality performance. We discuss the benefits and drawbacks of a collocated R&D function as they relate to manufacturing quality. Then, we empirically examine both the first-order effect of collocation, as well as important contingent/moderating effects.

025-1029 Knowledge Creation and Knowledge Transfer in New Product Development Projects

Wenli Xiao, Student, Georgia Institute Of Technology, United States
 Cheryl Gaimon, Professor, Georgia Institute Of Technology, United States
 Janice Carrillo, Associate Professor, University Of Florida, United States

We introduce models characterizing the linkages among three parallel stages of knowledge creation activities in an NPD project. The transfer of knowledge from one stage to another enhances the creation of knowledge at the latter stage. We provide a deep understanding of the nature of knowledge creation and knowledge transfer.

025-0479 A Preliminary Inquiry into Innovation Analytics for Managing Sequential Product Portfolios

Edward Anderson, Associate Professor, University Of Texas Austin, United States
 Nitin Joglekar, Associate Professor, Boston University, United States

Recently there has been a significant extension of PITM research into the multi-project level. However, many PITM projects are sequentially dependent upon one another because of their influence on market tastes, thus creating a complex system. We adapt information scaling ideas to propose analytics to navigate through this complexity.

025-0464 Managing Distributed Knowledge Work: Integration Strategies for Language and Geographic Barriers

Aravind Chandrasekaran, Assistant Professor, Ohio State University, United States
 Geoffrey Parker, Professor, Tulane University, United States
 Edward Anderson, Associate Professor, University Of Texas Austin, United States

We study the effects of two barriers to firm/supplier coordination: (1) distance and (2) language. Using a unique data set of multi-level performance measures for 55 outsourced NPD projects, we show under what conditions investments in integration mechanisms such as collocated personnel and supply chain integrators can overcome these barriers.

215	Sunday, 08:00 AM - 09:30 AM, Los Angeles (Floor 5) <i>Session:</i> Production Systems with Competition <i>Chair(s):</i> Jing Zhou	<i>Track:</i> Production Planning and Scheduling
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025-0117 Impact of Cournot competition and commitment contract on strategic inventory in a one manufacturer, two-retail

Jaejin Jang, Associate Professor, University Of Wisconsin Milwaukee, United States
 Vijayendra Viswanathan, Student, University Of Wisconsin Milwaukee, United States

Strategic Inventory (SI) has been studied in a supply chain with no downstream competition. This research shows Cournot competition between downstream retailers decreases SI between periods. It also shows, a commitment contract increases SI in the Cournot-competing retailer supply chain while it completely eliminates SI in the monopoly downstream case

025-0010 New dispatching rules to minimize the total weighted tardiness on the single machine

Yue Xi, Student, University Of Wisconsin Milwaukee, United States
 Jaejin Jang, Associate Professor, University Of Wisconsin Milwaukee, United States

The sequence dependent setup is classified into the continuous sequence dependent setup and the separable sequence dependent setup. For each type of setup, a dispatching rule is proposed to minimize the total weighted tardiness on the single machine with future ready time.

025-1052 Balancing Production, Inventory, and Delivery Costs in Paper Manufacturing

Neil Geismar, Associate Professor, Texas A&M University College Station, United States
 Nagesh Murthy, Associate Professor, University Of Oregon, United States

Supply chain scheduling in the paper industry minimizes the sum of production, inventory, and railcar delivery costs. A single plant serves multiple clients. Each customer's order contains multiple jobs with varying weight and width. The plant combines jobs from different customers into production sets of uniform weight and fixed width.

025-1068 Myopic versus Strategic Decisions with Production Cost Learning

Xiuli He, Assistant Professor, University Of North Carolina Charlotte, United States
 Tao Li, Student, University Of Texas Dallas, United States
 Suresh Sethi, Professor, University Of Texas Dallas, United States

We consider implications of the production cost learning in a decentralized supply chain in which the manufacturer has two production opportunities. The retailer can be myopic or strategic. A strategic retailer takes the learning opportunities into consideration. We derive the optimal pricing and production decisions for both types of retailers.

025-0979 The Value of Time Spent for Sequencing of Jobs in Random Sized Batches

Refik Gullu, Professor, Bogazici University, Turkey
 Aybek Korugan, Assistant Professor, Bogazici University, Turkey
 Miray Oner, Student, Istanbul Kultur University, Turkey

We investigate the impact of sequencing jobs arriving in random sized batches. Sequencing duration depends on the batch size. We compare the expected average flow time of jobs in unordered versus ordered systems. Batch arrivals follow a Poisson process while processing times of jobs are considered to be random.

216	Sunday, 08:00 AM - 09:30 AM, Northwestern (Floor 6) <i>Session:</i> Environmentally responsible supply management <i>Chair(s):</i> Janet Hartley	<i>Track:</i> Supply Management
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025-1744 Drivers of Supplier Adoption of Environmental Practices: A Transaction Cost and Institutional Theory Perspect

Wendy Tate, Assistant Professor, University of Tennessee, United States
 Lisa Ellram, Professor, Miami University, United States
 Kevin Dooley, Professor, Arizona State University, United States

Sustainable supply management incorporates practices which buying firms use to manage their dependence upon suppliers in creating environmentally-sound products. This research explores what influences suppliers to adopt environmentally-conscious practices. Using a transaction cost economics (TCE) and institutional theory lens, propositions are developed and tested to understand motivations of late-adopting suppliers

025-1743 Governance regimes for protected geographic indicators: The role of international agencies in promoting sustainability
Paul Skilton, Assistant Professor, Washington State University, United States

I explore the involvement of intergovernmental and nongovernmental organizations in the design of the supply chains for protected geographical indicator products. I describe the protections created by PGI designations, examine how the processes of establishing PGI status influence the structure of supply chains, and explain why governance structure is critical.

025-1742 Sustainable Product End-of-life Management: Shifting the Landfill Culture
Madeleine Pullman, Associate Professor, Portland State University, United States

I examine the reasons why a business might consider focusing on "closing the loop" or reducing the impact of products that have completed their useful life. We then move on to the different methods of reusing, reclaiming, and recycling products and packaging and look at some of the hottest trends.

025-1771 Configuration of Supply Chain Integration and Sustainable Production: A Profile Deviation Analysis
Constantin Blome, Assistant Professor, Universit  Catholique De Louvain, Belgium
Antony Paulraj, Associate Professor, University Of North Florida, United States
Ellen Wieck, Professor, Ebs Business School, Germany

Based on a European data set we analyze how the difference from an ideal profile of supply chain integration impacts performance. Furthermore, we separate supply chain integration in demand and supply side practices contributing to a further understanding of fit between these external practices and internal practices like sustainable production.

217	<p>Sunday, 08:00 AM - 09:30 AM, Ballroom C (Floor 5) <i>Track:</i> Healthcare Operations</p> <p><i>Session:</i> "Lean" and Organizational Learning</p> <p><i>Chair(s):</i> Debra Thompson</p>
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025-0830 Quality Improvement Education as an Integral Part of Core Curriculum for Physicians
Curt Hale, Health Systems Engineering Analyst, Mayo Clinic, United States

Practical quality and lean training can be provided to physicians during medical residencies and fellowships as an integral part of their education and practice. A successful pilot incorporated in the Mayo Clinic Critical Care Internal Medicine Fellowship Program is now part of the standard curriculum to advance quality in healthcare.

025-0880 Lessons in Lean Healthcare
Michael Pry, Director, Excelsa Health System, United States

This case presentation will focus on the application of lean at Excelsa Health a community based health system. Lean has been deployed to foster both rapid improvements of existing processes while building a bridge to the future through employee engagement. Strategies to promote organizational learning will be discussed.

025-1040 Experiments on Medication Administration: When do nurses speak up about work system problems?
Anita Tucker, Associate Professor, Harvard University, United States

We conducted a series of experiments to examine conditions under which nurses speak up about work system problems. We created a medication dispensing task and recruited participants at nursing conferences. Nurses speak up if necessary to complete their tasks or when their role in improvement was primed. Incentives were ineffective.

025-0357 Lean and Learning: Making it Stick
Margaret Falbo, Principal, Mimi Falbo, LLC, United States
Debra Thompson, Adjunct Faculty, University of Pittsburgh, United States

Ensuring effective organization adoption of lean principles requires acquisition of new skills from the board room to the frontline. Frequently, participants grasp the concepts and tools, but do not routinely integrate them into practice. A holistic approach to foster adoption and improve outcomes will be presented using case examples.

218	<p>Sunday, 08:00 AM - 09:30 AM, Kansas City (Floor 5) <i>Track:</i> Healthcare Operations</p> <p><i>Session:</i> Modeling and Analyzing Healthcare Operations</p> <p><i>Chair(s):</i> Urban Wemmerlov</p>
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025-0045 Optimal Deployment of Non-Physician Care Providers in Outpatient Clinics
Denise White, Consultant (Capacity Management) - Quality & Transformation Analytics, Cincinnati Children'S Hospital Medical Center, United States
Craig Froehle, Associate Professor, University Of Cincinnati, United States

Clinics often augment physicians with lower-cost providers like nurse practitioners. Using simulation and profit modeling, we compare the operational and financial implications of two common workflow models. The resulting optimal policy map includes a surprisingly large number of scenarios where the preferred workflow doesn't include non-physician providers at all.

025-0614 Operating Room Efficiency Improvement with Real-Time Information Sharing
Vikram Tiwari, Assistant Professor, University Of Houston, United States
David Berger, Professor, Baylor College of Medicine, United States

This research describes the improvements occurring in the day-of-surgery operations after implementation of a real-time patient tracking system in the Operating Room. Real-time information availability helps coordinate patient-flows, and empowers staff to manage their schedules better. How quickly and universally across all ORs these improvements occurred was a welcome surprise.

025-0622 Does Multi-tasking Improve Productivity?

Diwas Kc, Assistant Professor, Emory University, United States

We examine the effect of multitasking on performance in an emergency department. By drawing on recent findings in the experimental psychology literature we develop several hypotheses for the effect on performance. We find that multitasking has implications for the service encounter, including patient including patient flow and quality of care.

025-1030 Utilization-driven Appointment Scheduling in Outpatient Clinics

Wesley Williams, Director of Research & Development, Mental Health Center Of Denver, United States

Michele Samorani, Student, University Of Colorado Boulder, United States

Stephen Lawrence, Associate Professor, University Of Colorado Boulder, United States

Linda LaGanga, Director of Quality Systems & Operational Excellence, Mental Health Center Of Denver, United States

We introduce a practical model of expected utilization by provider and demonstrate how a set of clinics use it to increase the number of appointments booked, then apply an integrated data mining algorithm to book or overbook appointments in the right slots to maximize overall clinic benefits.

219	Sunday, 08:00 AM - 09:30 AM, Wisconsin (WI) (Floor 6) <i>Track:</i> Retail Operations
	<i>Session:</i> Competition in Retail Channels
	<i>Chair(s):</i> Haoying Sun

025-0144 Retailer's Incentive to Share Aggregate Inventory Information with Consumers

Hyoduk Shin, Assistant Professor, Northwestern University, United States

Ruomeng Cui, Student, Northeastern University, United States

A retailer sells two vertically-differentiated products to consumers. Customers inquire inventory information of their preferred version before coming to the store, which is costly. Retailer only shares aggregate inventory rather than each version's separate inventory. We discuss why a retailer may partially share inventory information and when it is optimal.

025-0443 Asymmetric Assortment Choices among Competing Retailers with Uninformed Consumers

Haoying Sun, Assistant Professor, Texas A&M University College Station, United States

Steve Gilbert, Professor, University Of Texas Austin, United States

We show that asymmetric assortment breadth among two competing retailers can emerge as equilibrium when consumers differ in their prior knowledge about their product preferences and shopping costs. Under this equilibrium, the price competition between the full line and the limited line retailers are softened.

025-1035 Retailer's Incentive to Share Aggregate Inventory Information with Consumers

Ruomeng Cui, Student, Northeastern University, United States

Hyoduk Shin, Assistant Professor, Northwestern University, United States

Consider an Apple retail store selling iPad of 32G and 16G versions. When customers inquire inventory information before they come to the store, Apple sometimes shares only the aggregate inventory level rather than each version's separate inventory information. We study why a retailer partially shares its inventory information with consumers.

025-1042 Channel Decision and Service-Product Bundling Strategy under Sequential Entry

Xiuli He, Assistant Professor, University Of North Carolina Charlotte, United States

Shu Zhou, Assistant Professor, San Jose State University, United States

A manufacturer produces and sells a product to an incumbent service provider who sells the bundle of the product and services to consumers. A potential entrant service provider offers a bundle of competitive service and product. We study the service providers' pricing and bundling decisions and the manufacturer's channel selection.

025-1109 Retailer Brand: Keep It Private or Not

Steve Gilbert, Professor, University Of Texas Austin, United States

Liwen Chen, Assistant Professor, City University Of Hong Kong, United States

Yunchuan Liu, Assistant Professor, University Of Illinois Urbana-Champaign, United States

In this paper, we study the implications when a retailer with a store brand decides whether to keep the store brand for itself or sell it also through a competing retailer. The implications for distribution channel relationship and market competitiveness are also studied.

220	Sunday, 08:00 AM - 09:30 AM, River North (Floor 2) <i>Track:</i> Supply Management
	<i>Session:</i> Information and SCM
	<i>Chair(s):</i> Noam Shamir Hyoduk Shin

025-0528 Concurrency and Experience in Secondary Market B2B Auctions

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

Anand Gopal, Associate Professor, University Of Maryland, United States

Ali Pilehvar, Student, University Of Maryland, United States

Using data collected from a large wholesale liquidator who runs auctions to sell the bundles of returned goods and excess inventory, we study the behavior of these secondary market B2B auctions. We empirically investigate how and when market concurrency and buyers' experience impact their participation and willingness to pay.

025-0525 Strategic Communication for Capacity Alignment with Pricing in a Supply Chain

Noam Shamir, , Northwestern University, United States

Leon Chu, Assistant Professor, University Of South California, United States

Hyoduk Shin, Assistant Professor, Northwestern University, United States

A retailer with demand forecast information decides whether to strategically communicate his private information with the manufacturer, after which the manufacturer determines the capacity and the wholesale price. We show that if the value of information is large, the information can be voluntarily shared.

025-1337 Contracts in Global Firms Facing Cost Information Asymmetry in Presence of Tax Benefits

Masha Shunko, Assistant Professor, Purdue University, United States
 Laurens Debo, Associate Professor, University Of Chicago, United States
 Srinagesh Gavirneni, Associate Professor, Cornell University, United States

Global firms can use contracts between internal divisions situated in different tax jurisdictions to allocate profits. Contract parameters affect performance of the divisional managers and taxes paid. We analyze four different contract types, find optimal parameters to counter the tradeoff between exploiting tax benefits and providing incentives, compare these contracts.

025-1394 Buying from the Babbling Newsvendor: Availability Information and Cheap Talk

Gad Allon, Associate Professor, Northwestern University, United States
 Achal Bassamboo, Associate Professor, Northwestern University, United States

Provision of real-time inventory availability information by a firm to its customers has become prevalent in recent years. Often, this information cannot be credibly verified by the customer. We analyze the problem of how a firm can influence its customers' buying behavior.

221	Sunday, 08:00 AM - 09:30 AM, Cook (Floor 3) <i>Track:</i> Supply Chain Risk <i>Session:</i> Operational Flexibility in Managing Supply Chain Risks 1 <i>Chair(s):</i> Suleyman Demirel
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025-0142 Strategic Behavior of Suppliers in the Face of Production Disruptions

Suleyman Demirel, Student, University Of Michigan Ann Arbor, United States
 Roman Kapuscinski, Professor, University Of Michigan Ann Arbor, United States
 Ching-Hua Chen-Ritzo, Research Scientist, IBM, United States

A manufacturer can either sole-source from a reliable supplier or an unreliable supplier or adopt a flexible sourcing strategy by sourcing from both. We find that strategic supplier behavior can lead to no benefit from flexible sourcing, hence manufacturer may avoid flexibility. Supplier competition may lead to socially undesirable outcome.

025-0123 R&D Investment and Wholesale Price for New Product Development in Supply Chain with Time-sensitive Demand

Junghee Lee, Student, Washington University St Louis, United States
 Nan Yang, Assistant Professor, Washington University St Louis, United States

We study dynamics between firms' profits, R&D investment and the wholesale price in a practical environment: uncertain R&D, time decreasing demand, and moral hazard. Our work draws new managerial insights about supplier selection in terms of the supplier's financial condition and the demand time sensitivity with closed form solutions.

025-0547 Horizontal Capacity Coordination for Risk Management and Flexibility

Xiaole Wu, Assistant Professor, Fudan University, China
 Panos Kouvelis, Professor, Washington University St Louis, United States
 Hirofumi Matsuo, Professor, Kobe University, Japan

Motivated by the dual sourcing and contracting practices in the semiconductor industry, we study two prevailing types of contracts that deal with horizontal capacity coordination issues between two possible sources: an integrated device manufacturer (IDM) and a foundry. Our analysis provides insights on horizontal capacity coordination beyond the semiconductor industry.

025-0996 Managing Risks in a Supply Chain: The Case of Misaligned Priorities

Sheeba Khan, Student, Qatar University, Qatar
 MohdNishat Faisal, Assistant Professor, Qatar University, Qatar

Supply chain risk management is the process of risk mitigation achieved through collaboration, coordination and application of risk management tools among the supply chain partners, to ensure continuity coupled with long-term profitability of the supply chain. As there can be many risks that can disrupt a supply chain and similarly many variables that play a role in risk mitigation, the present research utilizes fuzzy-AHP methodology to prioritize risks and risk mitigation variables across the supply chain. The research shows that for partners in a supply chain the priorities differ for various risks and also they have different priorities for various risk mitigation variables. This results in non-alignment of risk mitigation strategies and thus makes the task of managing risks difficult for the operations and supply chain managers.

222	Sunday, 08:00 AM - 09:30 AM, Ballroom G (Floor 5) <i>Track:</i> Service Operations <i>Session:</i> Management of Discretionary Services <i>Chair(s):</i> Laurens Debo
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025-0712 The Implications of the Customer-Provider Interaction on the Design of Services

Ioannis Bellos, Student, Georgia Institute Of Technology, United States
 Stylianos Kavadias, Associate Professor, Georgia Institute Of Technology, United States
 Beril Toktay, Professor, Georgia Institute Of Technology, United States

The design of services presents a unique challenge: customers interact with the provider during the service delivery process in complex and uncertain ways. We assume that during this interaction customer experience evolves stochastically and we study the implications of the provider's design decisions such effort, price and timing of price.

025-0694 Pricing Time-sensitive Services Based on Realized Performance

Opher Baron, Associate Professor, University Of Toronto, Canada
 Yoav Kerner, Assistant Professor, Ben Gurion University of the Negev, Israel
 Philipp Afeche, Assistant Professor, University Of Toronto, Canada

Services such as Fedex charge an upfront fee but reimburse customers for delivery delays. Existing lead time pricing studies ignore such price adjustments based on realized performance. This paper contributes to filling this gap. It studies the optimal design of price contracts that also charge based on actual performance.

025-0824 Workload Crisis Management in Knowledge-Based Service Systems

Yao Cheng, Assistant Professor, Northwestern University, United States
Wallace Hopp, Professor, University Of Michigan Ann Arbor, United States
Seyed Iravani, Professor, Northwestern University, United States
Daniel Diermeier, Professor, Northwestern University, United States

We propose a formal modeling framework for characterizing knowledge of agents in service systems that make binary decisions. We analyze the structural ability of those systems to respond quickly and effectively to events that cause a sudden increase in utilization of system resources.

223

Sunday, 08:00 AM - 09:30 AM, Miami (Floor 5)

Track: Capacity Management

Session: Capacity Planning Under Forecast Updates

Chair(s): Sechan Oh

025-0179 Capacity Planning under Dynamic Evolution of Asymmetric Demand Forecasts

Sechan Oh, Research Scientist, IBM, United States
Ozalp Ozer, Professor, University Of Texas Dallas, United States

We model the evolution of forecasts generated by multiple forecasters with asymmetric demand information and generalized the MMFE framework. Using this framework, we study a supplier's problem of eliciting credible forecast information from a manufacturer for capacity planning when both parties obtain asymmetric demand information over time.

025-1426 Excess Capacity and Wealth Consequences

Alan Cannon, Associate Professor, University Of Texas Arlington, United States
Carol Cagle, Lecturer, Texas Christian University, United States

This study builds on the strategy and organization theory streams in exploring the financial implications of excess capacity. Archival data are analyzed via Hierarchical Linear Modeling in studying the relationship between excess capacity and financial performance over time.

025-0670 United We Stand? Risk Pooling and Capacity Ownership in Joint Ventures

Guillaume Roels, Assistant Professor, University Of California Los Angeles, United States
Ying Wei, Assistant Professor, Jinan University, China
Philippe Chevalier, Professor, UCLouvain, Belgium

We study how to structure a joint venture between manufacturing firms that pool their capacity in order to reduce their overall demand risk. In particular, we study the influence of capacity ownership (joint or separate) on the joint-venture's capacity coordination and long-term viability.

025-0778 Capacity Planning in the Semiconductor Industry: Dual-Mode Procurement with Options

Chen Peng, Researcher, Google Inc., United States
Karl Kempf, Fellow, Intel Corporation, United States
Erik Hertzler, Staff Engineer, Intel Corporation, United States
Feryal Erhun, Assistant Professor, Stanford University, United States

To help a firm reduce inefficiencies associated with equipment capacity planning, we propose a dual-mode equipment procurement (DMEP) framework. DMEP combines dual-source procurement with option contracts. The DMEP framework has been implemented at Intel Corporation and has resulted in savings of tens of millions of dollars for one process technology.

224

Sunday, 08:00 AM - 09:30 AM, Minnesota (MN) (Floor 6)

Track: Inventory Management

Session: Inventory Management

Chair(s): Jason Acimovic

025-1518 Spare Part Management: A Life-Cycle Approach

Nesim Erkip, Professor, Bilkent University, Turkey

The spare part problem considered is for a planning environment where a component is used in the assembly of other products and as a spare part. The purpose of the research is to establish the foundation for analyzing the inventory problem of such a component for its life-cycle.

025-0544 Dynamic Scheduling Policy in a Make-to-stock System with Two Demand Classes of Different Variability

Apurva Jain, Associate Professor, University Of Washington, United States
Jieling Han, Student, University Of Washington, United States

In a two-class production-inventory system, we analyze the case where demand classes differ in their variability. We develop characteristics of the optimal policy to minimize the sum of holding and backorder costs across classes. We extend the analysis to the case where partial information about arrival process is available.

025-1047 Inventory Replenishment in an Online Retail Environment

Jason Acimovic, Student, Massachusetts Institute Of Technology, United States
Stephen Graves, Professor, Massachusetts Institute Of Technology, United States

Online retailers operate multiple warehouses with centralized order fulfillment and inventory management. Individual warehouses stock out frequently due to shared safety-stocks. When this happens, demand overflows to another warehouse. We model this phenomenon and characterize its dynamics in order to develop good inventory policies that reduce shipping & holding costs.

225

Sunday, 08:00 AM - 09:30 AM, Indiana (Floor 6)

Track: Vendor and Supply Contracts

Session: Supply Chain Contracts

Chair(s): Yong He

025-0927 Research on the equilibrium of competitive supply chain in the presence of customer returns

Haiyan Wang, Professor, Southeast University, China
Jian Liu, Student, Southeast University, China

We consider a model with two competing supply chain with customer returns. The equilibrium solution is analyzed in three competition models, including II, DI and DD competition model. We find that the equilibrium retail price and profit in DD model are higher than that in II model.

025-1362 Mechanism design on allocating carbon permits in supply chain optimization

Sijie Li, Associate Professor, Southeast University, China

We employ auction theory to propose the forms of incentive mechanisms to encourage companies to adopt green initiatives. In the paper, the inbound and outbound service times are the decision variables for the cost minimization problem, two guaranteed outbound service times' problems with and without social damage costs are formulated.

025-0920 Optimal Order of a Supply Chain under the Effect of Group Purchase

Ru Juan, Student, Southeast University, China
Haiyan Wang, Professor, Southeast University, China

This article develops an optimal control model of a single supply chain triggered by the demand produced by group purchases to find the optimal order. Assuming demand information being shared totally, we give the optimal order by using optimal control theory and study the effect of group purchase on it.

226	Sunday, 01:00 PM - 02:30 PM, Scottsdale (Floor 5)	<i>Track:</i> Behavioral Operations
	<i>Session:</i> Managing Bounded Rationality and Other Behavior Effects in Decision Making	
	<i>Chair(s):</i> Kay-Yut Chen	

025-0531 Behavioral Engineering of Supply Chain Contract: Impact of Bounded Rationality and Individual Heterogeneity

Yan Wu, Assistant Professor, University Of Kansas, United States
 Kay-Yut Chen, Principal Scientist, Hp Labs, United States

In this paper, we show that the optimal contract design depends on the level of bounded rationality in decision-makers. We consider two aspects of bounded rationality, probabilistic choice and anchoring. We found that the profit performance and the "optimal" parameters of a contract are very sensitive to empirical newsvendor behavior.

025-0532 Decision Makings under Economic Order Quantity Settings

Kay-Yut Chen, Principal Scientist, Hp Labs, United States
 Yan Wu, Assistant Professor, University Of Kansas, United States

In this paper, we study ordering behavior under the EOQ setting. We find subjects error even under deterministic demand. Moreover, we find how demand and cost information is "framed" to subjects affects their decisions. A behavioral model that considers bounded rationality and framing effect is proposed to explain the observations.

025-1106 The Sunk Cost Fallacy in Reverse Auctions

Yu Wu, Student, Stanford University, United States
 Christina Aperjis, Research Scientist, Hp Labs, United States

We empirically study buyer behavior in an online outsourcing website where sealed bid auctions are held with bids arriving over time. We focus on when buyers terminate their requests and how they behave when choosing the winning bid. We provide a simple probabilistic model that captures the behavior of buyers.

025-1638 Does Personality Explain Order Decisions in the Beer Game?

Brad Meyer, Associate Professor, Drake University, United States
 Radostina Purvanova, Assistant Professor, Drake University, United States

Ordering decisions in the Beer Game have long been understood as a behavioral phenomenon. This paper explores whether personality, as measured by the Big 5 personality traits, can explain differences in behavior between players. Results of a pilot study are presented.

227	Sunday, 01:00 PM - 02:30 PM, Lincolnshire II (Floor 6)	<i>Track:</i> Empirical Research in OM
	<i>Session:</i> Empirical Research on Supply Chain Relationships, Team Structure and Experience	
	<i>Chair(s):</i> Yan Dong George Easton	

025-0241 Avoiding the Dissolution of a Strategic Manufacturer-Industrial Supplier Relationship: A Scenario-Based Role-Playing

Yi-Su Chen, Assistant Professor, University of Michigan - Dearborn, United States
 Susan Goldstein, Associate Professor, University Of Minnesota, United States
 Johnny Rungtusanatham, Professor, Ohio State University, United States

This paper tests a divorce-motivated model of strategic manufacturer-industrial supplier relationship dissolution. Data, collected using a scenario-based role-playing, repeated measures experiment from sourcing professionals, were analyzed via a general linear mixed model. Results revealed that a history of good supplier performance may lead to lower tolerance for supplier mistakes.

025-0210 A Contracts View of Conflict Resolution in Supply Chain Relationships

James Hill, Associate Professor, Ohio State University, United States
 Stephanie Eckerd, Assistant Professor, University Of Maryland, United States

We explore the interplay of four contract types - psychological, social, relational, and written - and their influence on conflict resolution in supply chain relationships. Data collected from a survey of members of the National Contract Management Association is analyzed using structural equation modeling to test the hypothesized relationships.

025-0373 The Role of Experience in Six Sigma Project Success: An Empirical Analysis of Improvement Projects

George Easton, Associate Professor, Emory University, United States
 Eve Rosenzweig, Associate Professor, Emory University, United States

We examine the role of individual experience, organizational experience, team familiarity, and team leader experience on project success. Based on archival data from six sigma improvement teams, team leader experience dominates the effects of the other experience variables. Alternatively, no relationship between team familiarity and project success is observed.

025-0916 Team Structures and New Product Development Time

Xiaowen Huang, Associate Professor, Miami University, United States

This study investigates how the use of different team structures affects new product development time. Building upon the literature on new product development and organization theories, we identify a set of project-, team-, and organizational- related factors that modify the relationship between team structures and new product development time.

228	Sunday, 01:00 PM - 02:30 PM, Ohio State (Floor 6)	<i>Track:</i> Humanitarian Operations and Crisis Management
	<i>Session:</i> Coordination and Collaboration Issues in Humanitarian Operations	
	<i>Chair(s):</i> Nezhil Altay Raktim Pal	

025-0439 Humanitarian Supply Chains: Collaboration and Partnerships

Nezhil Altay, Associate Professor, Depaul University, United States
 Heather Lutz, Assistant Professor, University Of St. Thomas, United States

Laura Birou, Associate Professor, Louisiana Tech University, United States

The pursuit of competitive advantage has spawned the growth of "fused" relationships among supply chain partners. Humanitarian Supply Chains demonstrate similar needs, to identify and establish dependable sources of supply. This research is dedicated to understanding the nature of successful supply chain partnerships in humanitarian and disaster relief organizations.

025-0454 Fleet management policies in humanitarian operations: an empirical investigation

Mahyar Eftekhari, Student, Hec Paris, France
 Luk Van Wassenhove, Professor, INSEAD, France
 Andrea Masini, Associate Professor, Hec Paris, France

To optimize fleet performance and maximize effectiveness, humanitarian organizations recommend policies to enhance individual vehicles' utilization and to reduce their operational cost. Using field data provided by the ICRC, this paper empirically studies whether these policies are implemented and then analyzes their impact on the vehicles' operational cost and utilization.

025-0541 Strategies for Disaster Recovery: A Framework for Value-Based Decision Making

Roberta Russell, Professor, Virginia Polytechnic Institute And State University, United States
 Christopher Zobel, Associate Professor, Virginia Polytechnic Institute And State University, United States
 Josey Chacko, Student, Virginia Polytechnic Institute And State University, United States
 Loren Rees, Professor, Virginia Polytechnic Institute And State University, United States

Decisions made in a crisis mode of disaster recovery may not adequately reflect the priorities, values and preferences of a community. We present a framework for assessing community values and priorities during pre-disaster planning. The values assessment is then used to quantitatively evaluate potential strategies for disaster recovery.

025-0508 Information Flow in Humanitarian Supply Chains: The Case of the Cluster Approach

Raktim Pal, Associate Professor, James Madison University, United States
 Nezih Altay, Associate Professor, Depaul University, United States

This paper takes an information-processing based view of the most recent meta-strategy for humanitarian response, UN's Cluster Approach and aims to show using agent-based modeling and simulation that clusters, if properly utilized, could encourage better information flow and thus facilitate effective response to disasters.

025-0333 Coordination and collaboration in emergency management in Australia

Kate Hughes, Student, Macquarie Graduate School of Management, Australia

Emergency management and disaster response in Australia has a top-down centralized framework (AIIMS) with front-line units that manage the response bottom-up. The coordination between units in one organization and the demarcation and coordination between the different organizations in this (almost) counterintuitive system is both centralized and decentralized with amazing results.

229	Sunday, 01:00 PM - 02:30 PM, Purdue (Floor 6)	<i>Track:</i> Marketing and OM Interface
	<i>Session:</i> Consumer Preferences and Product Design	
	<i>Chair(s):</i> Sreekumar Bhaskaran Karthik Ramachandran	

025-1628 The Role of Modular Upgradability as a Green Design Strategy

Vishal Agrawal, Assistant Professor, Georgetown University, United States
 Sezer Ulku, Assistant Professor, Georgetown University, United States

We study the efficacy of modular upgradability as a design-for-environment strategy. By endogenizing a firm's development and introduction decisions and by considering a product's entire life cycle, we identify when modular upgradable architecture leads to lower environmental impact and is also more profitable for a firm.

025-1656 Channel Preference and a Dual Channel Retailer: Shaping Demand to Match Constrained Supply

Wen Chen, Student, the University of Texas at Austin, United States
 Adam Fleischhacker, Assistant Professor, University of Delaware, United States
 Michael Katehakis, Professor, The State University of New Jersey, United States

We study a retailer serving customers through both an online channel and a physical channel. We find an interesting result where at lower inventory levels, a retailer may prefer sales through their online channel even in cases where the marginal profit of the physical channel is significantly larger.

025-1585 Quality Consciousness and Perceived Value: Implications for Product Design

Karthik Ramachandran, Assistant Professor, Southern Methodist University, United States
 Priyali Rajagopal, Assistant Professor, Southern Methodist University, United States
 Sreekumar Bhaskaran, Assistant Professor, Southern Methodist University, United States

Economics and marketing research assumes that highly quality consciousness consumers will be willing to pay more than consumers who have low quality consciousness, for any given level of quality. We experimentally invalidate this assumption and explore its analytical implications.

025-1738 Competing Newsvendors in Expanding Markets

Saurabh Bansal, Assistant Professor, Penn State University University Park, United States

We consider newsvendors who compete for a fixed market, for example, within a sports arena. We first provide results to update the newsvendors' optimal inventory levels, expected profits, fill rates and service levels when the market expands. Subsequently, we show that the updates are independent of customers' substitution behavior.

230	Sunday, 01:00 PM - 02:30 PM, Great America II (Floor 6)	<i>Track:</i> OM Practice
	<i>Session:</i> OM Applications in the Public Sector	
	<i>Chair(s):</i> Muer Yang Michael Fry	

025-1453 Closed Loop Supply Chains for U.S., Japan and EU Auto Industries - A System Dynamics Study

Sameer Kumar, Professor, University Of St. Thomas, United States

System Dynamics analysis of the U.S., Japan and EU auto industries' reverse value chains was conducted to explore the impact of government regulations, financial incentives and market pricing for remanufactured and recycle materials on cash flows and use of such raw materials for car manufacturers in these three market segments.

025-1624 A Multi-Period Dynamic Location Planning Model for Emergency Response

Burcu Keskin, Assistant Professor, University Of Alabama Tuscaloosa, United States

Sharif Melouk, Assistant Professor, University Of Alabama Tuscaloosa, United States

Jianing Zhi, Student, University Of Alabama Tuscaloosa, United States

We investigate a multi-period ambulance location planning problem with the objective of minimizing total cost while maintaining acceptable incident response times. The network consists of supply centers, responder locations, incident locations, and hospitals. We perform experimentation on network size and incident/responder characteristics. We discuss model performance and managerial insights.

025-0358 Assessing the individual and synergistic effect of quality management practices on operations performance

Sarah Wu, Assistant Professor, Fordham University, United States

The study is to resolve the inconsistency findings of whether all quality management practices are necessary to improve quality performance. We distinguish individual effect of each quality management practice and their synergistic effect. These two effects are empirically assessed in regression models using survey data collected from China.

025-1795 Efficient-Equitable Allocation Policies for the Voting Systems

Muer Yang, Assistant Professor, University Of St. Thomas, United States

Ted Allen, Associate Professor, Ohio State University, United States

Michael Fry, Associate Professor, University Of Cincinnati, United States

W. Kelton, Professor, University Of Cincinnati, United States

Providing equal access to voting is guaranteed by US federal law but exactly how this decree extends to waiting lines has not been clarified. We develop a rigorous allocation algorithm to address efficiency and equity of the voting process, and also suggest several operational improvements to the voting process.

231	Sunday, 01:00 PM - 02:30 PM, Dupage (Floor 3)	<i>Track:</i> Scheduling and Logistics
	<i>Session:</i> Supply Chain Scheduling	
	<i>Chair(s):</i> Zhi-Long Chen	

025-0224 Supply Chain Scheduling with Fixed Departure Times

Zhi-long Chen, Professor, University Of Maryland, United States

Joseph Leung, Professor, New Jersey Inst Of Technology, United States

We consider a supply chain scheduling model motivated by make-to-order environment where completed orders are delivered by vehicles with fixed departure times. The objective is to optimize order delivery performance and associated delivery cost. We show that several problems under this model can be solved by efficient algorithms.

025-0226 Models for Planning JIT System with Remanufacturing.

Kyung Sung Jung, Student, University Of Texas Dallas, United States

Milind Dawande, Professor, University Of Texas Dallas, United States

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

Chelliah Sriskandarajah, Professor, University Of Texas Dallas, United States

Closed-loop supply planning problems at the remanufacturer are studied. To minimize total costs, optimal production plans are developed for different production strategies, differentiated by whether inventories of products are carried, and the demand of retailers are re-sequenced. Effects of production capacity are also explored. Comprehensive computational studies provide managerial insights.

025-0904 Coordinated Scheduling of Production and Delivery with Production Window and Delivery Capacity Constraint

Hairong Zhao, Associate Professor, calumet, United States

Yumei Huo, Associate Professor, City University Of New York, United States

Bin Fu, Associate Professor, University Of Texas Pan American, United States

We consider the coordinated production and delivery scheduling problem. There is a set of jobs each with a committed delivery time, processing time, production window, and profit; one or more fixed delivery times each with a capacity. The objective is to maximize the total profit. We developed an approximation Scheme.

025-1549 A Cooperative Savings Game Approach to a Time Sensitive Capacity Allocation and Scheduling Problem

Tolga Aydinliyim, Assistant Professor, University Of Oregon, United States

George Vairaktarakis, Professor, Case Western Reserve University, United States

We analyze transfer payment schemes that facilitate coordination in a setting whereby multiple agents share flexible processing capacity alongside their respective dedicated resources. Using a cooperative game theory approach, we propose robust core allocation rules that distribute rescheduling savings in an equitable way among agents with time sensitive demand requirements.

232	Sunday, 01:00 PM - 02:30 PM, Ballroom A (Floor 5)	<i>Track:</i> Sustainable Operations
	<i>Session:</i> Competition and Collaboration in Sustainable Supply Chains	
	<i>Chair(s):</i> Iuri Gavronski	

025-1127 Manufacturing Strategy: Do Institutions Matter?

Iuri Gavronski, Assistant Professor, UNISINOS, Brazil

Vitor Brock, Student, UNISINOS, Brazil

Institutions play a pivotal role in manufacturing strategy. We provide preliminary data analysis of a recent survey collected in Canada and in Brazil. We compare important variables of manufacturing strategy in these institutional contexts, such as the competitive priorities, environmental management, green supply management, and organizational learning.

025-1619 Investigating the Role of Collaboration in the Electric Vehicle Adoption Decision

Michael Magazine, Professor, University Of Cincinnati, United States
 Uday Rao, Associate Professor, University Of Cincinnati, United States
 Saravanan Kuppasamy, Student, University Of Cincinnati, United States

We present a research framework that captures interactions between a taxi cab company and an infrastructure provider. We show that taxi cabs characterized by the distance traveled combined with the service plans offered by the infrastructure influence the electric vehicle adoption decision.

025-1377 The Role of Competitive Capabilities and Stakeholder Pressure in the Adoption of Environmental Practices

Suresh Tadisina, Professor, Southern Illinois University Carbondale, United States
 Teresa Betts, Assistant Professor, Murray State University, United States

This research examined the effect of manufacturing plants' competitive capabilities and their adoption of environmental practices. A Natural Resource Based View theoretical approach was utilized to test hypotheses surrounding how plants with specific competitive capabilities and specific stakeholder pressures would have a greater likelihood of implementing sets of environmental practices.

233	Sunday, 01:00 PM - 02:30 PM, Denver (Floor 5) <i>Track:</i> Sustainable Operations
	<i>Session:</i> Green Practices in Manufacturing, Transport and Recycling
	<i>Chair(s):</i> Panagiotis Ypsilantis

025-0245 Disciplining Poor Environmental Management: Increased Performance for Green Acquirers of Dirty Firms

Pankaj Patel, Assistant Professor, Ball State University, United States
 David King, Associate Professor, Marquette University, United States

Firms with green capabilities can realize higher short and long-term performance by acquiring firms with higher pollution of related toxic chemicals by paying a lower premium and lowering toxic emissions. Theory and hypothesis are developed and tested using a sample of 371 acquirers and 2,963 acquisitions between 1995 and 2008.

025-1552 Are green manufacturing investments related to manufacturing performance everywhere?

Susana Pereira, Professor, Fundacao Getulio Vargas, Brazil
 Iuri Gavronski, Assistant Professor, UNISINOS, Brazil
 Guilherme Martins, Student, Fundacao Getulio Vargas, Brazil

A debate in manufacturing strategy is whether green manufacturing investments (GMI) are related to manufacturing performance. We find evidence that GMI are positively related to manufacturing performance, despite the location and the industry of the plants. We draw empirical evidence from 876 plants, in 18 countries, and 21 industries.

025-1467 Periodic Scheduling of Recycling and Waste Management Services

Milind Dawande, Professor, University Of Texas Dallas, United States
 Chelliah Sriskandarajah, Professor, University Of Texas Dallas, United States
 Kathryn Stecke, Professor, University Of Texas Dallas, United States
 Osman Kazan, Student, PhD Candidate, United States

We show that the services of a national recycling management company correspond to a challenging scheduling problem. Analyses show that the problem is NP-hard, therefore approximation algorithms are employed. Proposed application solves real-life problems and randomly-generated instances very efficiently and results in significant savings.

025-1092 Pricing of intermodal transportation network services in a competitive environment

Panagiotis Ypsilantis, Student, Rotterdam School Of Management, Netherlands
 Rob Zuidwijk, Professor, Erasmus University Rotterdam, Netherlands

Container transportation networks connect sea ports with terminals inland while using sustainable modes of transportation. We consider the pricing of intermodal transportation network services in a competitive environment by using bi-level programming techniques. The application of the method to a real life case is also considered.

234	Sunday, 01:00 PM - 02:30 PM, Ballroom H (Floor 5) <i>Track:</i> Teaching in OM
	<i>Session:</i> Teaching Innovation and Sustainability
	<i>Chair(s):</i> Tim Kraft Jeremy Hutchison-Krupat

025-0905 Teaching Innovation through Product Design and Development Courses

Sebastian Fixson, Assistant Professor, Babson College, United States

One vehicle to teach innovation is interdisciplinary courses with hands-on projects that cover the process from opportunity recognition, to user studies, to idea generation, selection, and refinement, including prototyping and economic analyses. In this talk, I will discuss benefits and challenges of such courses, in particular when involving multiple schools.

025-0203 Teaching Sustainability at UCLA Anderson

Charles Corbett, Professor, University Of California Los Angeles, United States

This session will describe the outline of the "Business and Environment" MBA elective that I have taught off and on at UCLA Anderson since 2002, as well as the campus-wide Leaders in Sustainability graduate certificate program that I started in 2007.

025-1277 Teaching portfolios with a role play

Juergen Mihm, Assistant Professor, INSEAD, France

Teaching the students how to build portfolios using only case material is difficult, since the intricate trade-offs of the portfolio definition process only come to life with higher emotional involvement. We show how a role play can go far beyond traditional methods in providing insights.

025-0768 An Environmental Operations Course at the Doctoral Level

Ravi Subramanian, Assistant Professor, Georgia Institute Of Technology, United States

This presentation will introduce the doctoral course in environmental operations offered at the College of Management, Georgia Tech. This course offers an initial multidisciplinary exposure to the field and thereafter focuses on legislative and competitive issues at the OM-environment interface. The course material spans descriptive, analytical, and empirical papers.

235	Sunday, 01:00 PM - 02:30 PM, Illinois (IL) (Floor 6) <i>Session:</i> Manufacturing Strategy <i>Chair(s):</i> Torbjørn Netland	<i>Track:</i> Manufacturing Operations
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025-0432 The effects of managerial actions on the successful implementation of corporate improvement programmes

Kasra Ferdows, Professor, Georgetown University, United States
Torbjørn Netland, Student, Georgetown University, United States

With the aim to increase competitiveness throughout their global manufacturing networks, multinational companies develop corporate improvement programmes. In this case study of the Volvo Group's globally deployed Volvo Production System we investigate the effects of actions that management undertakes to increase implementation of a corporate improvement programme.

025-0822 Empirical Study on Relationship between Quality Management Practices and Cultural Perspectives

Anh Phan, Lecturer, University of Economics and Business, Vietnam National University, Hanoi, Vietnam
Yoshiki Matsui, Professor, Yokohama National University, Japan

We investigate the link between quality management practices and different culture dimensions in manufacturing plants. Analysis of survey data collected from 163 manufacturing plants in five countries indicates that the collectivism, uncertainty avoidance, and power distance could significantly influence the successful implementation of shop floor and cross-functional quality management practices.

025-1236 Change in competitiveness, practices leads to performance: A longitudinal study 1993-2010

Jarmo Toivanen, Senior Lecturer, Aalto University, Finland

In this multiple case study we research how use of industrial practices has influenced to operational performance in past two decades. Interesting finding is that regardless of the economic recession in 2008, those companies who had continued investing in practices in spite of decreased economics, have increased their operational performance.

025-0885 A tentative comprehensive manufacturing strategy framework adapted to the requirements in SME

Kristina Safsten, Associate Professor, Jonkoping University, Sweden
Malin Löfving, Student, Jonkoping University, Sweden
Nina Edh, Student, Chalmers University Of Technology, Sweden
Mats Winroth, Associate Professor, Chalmers University Of Technology, Sweden

It is well-known that small and medium sized manufacturing enterprises (SMMEs) lack resources to work actively with their manufacturing strategies. Previous frameworks and tools have shown to work fairly well, but they are too complicated for the SMMEs. This paper presents a suggestion for an easy to use tool.

236	Sunday, 01:00 PM - 02:30 PM, Ballroom B (Floor 5) <i>Session:</i> Supply Chain Contracting <i>Chair(s):</i> Suresh Sethi	<i>Track:</i> Supply Chain Management
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025-1597 Robustness of Supply Chain Coordination Contracts: Taxonomy, Examples, and Structural Results

Suresh Sethi, Professor, University Of Texas Dallas, United States
Houmin Yan, Professor, City University Of Hong Kong, China
Meng Lu, Student, City University Of Hong Kong, China

This research addresses robustness of design, evaluation, and implementation for coordinating contracts. We develop a consistency framework for supply chain contracts and classify a number of well-studied ones into groups. We demonstrate with examples that a contract can be evaluated by its consistency properties.

025-1706 Contractual clauses: When does cultural distance matter?

Curtis Grimm, Professor, University Of Maryland, United States
Dina Ribbink, Assistant Professor, University Of Western Ontario, Canada

Using a unique data set of contracts from a Global Fortune 500 company, we investigate the effect of cultural distance on various contract clauses. We find that more similar cultural backgrounds between partners results in greater flexibility in contracts, while more cultural distance results in more rigid contracts.

025-0761 Supply Chain Colaboration Through Contracts: An Approach Using the BATNA Method

Ricardo Cassel, Associate Professor, UNISINOS, Brazil
Daniel Lacerda, Professor, UNISINOS, Brazil
Gustavo Dienstmann, Relationship Manager, Banco do Brasil S.A., Brazil

The objective of this paper is to perform a theoretical review about the BATNA method, detailing its implementation steps and the requirements for its effectiveness. It also analyses the usage of the method in the supply chain contract management, discussing its limitations and adoption requirements.

025-0797 Performance based Contracting in the Presence of Initial Acquisition and After-sales Service

Nishant Mishra, Assistant Professor, Rotterdam School Of Management, Netherlands

We consider performance based contracting between two profit maximizing players in the presence of initial purchase decision and after-sales service. We compare the PBC with the transaction based contract under various compliance regimes and identify conditions under which the PBC can result in similar efficiency and higher availability of products.

025-0019 Managing Supply Chain Finance- A Conceptual Framework

Dileep More, Assistant Professor, Indian Institute Of Management Calcutta, India
Arqum Mateen, Student, Indian Institute Of Management Calcutta, India

Companies recognized that they must focus on physical, information and monetary flows in the SC. In this paper we present a conceptual framework of supply chain finance, highlighting its linkage with the organization's strategy, identifying the core and focus areas of SCF, challenges in its implementation, and its impact.

237	Sunday, 01:00 PM - 02:30 PM, Houston (Floor 5) <i>Session:</i> Organizing Supply Chains <i>Chair(s):</i> Prabir Bagchi	<i>Track:</i> Supply Chain Management
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025-0673 Organizational Competence in the Supply Chain

Ricardo Cassel, Associate Professor, UNISINOS, Brazil
Aline Dresch, Student, UNISINOS, Brazil
Douglas Veit, Student, UNISINOS, Brazil
Daniel Lacerda, Professor, UNISINOS, Brazil
Claudia Bitencourt, Professor, UNISINOS, Brazil

This paper aims to perform a theoretical review on the organizational competences issue, from the supply chain perspective. The paper analyses the influence of the organizational competences of the governing company in its suppliers' behavior and discusses the competitive factors that may influence these relations.

025-1113 Supply Network versus Supply Chain: Competition or Coordination

John Visich, Associate Professor, Bryant University, United States
Xiuli He, Assistant Professor, University Of North Carolina Charlotte, United States
Qiannong Gu, Assistant Professor, Sam Houston State University, United States

Most supply chain modeling study focus on one-to-one relationship in supply chain. This research examines the difference between many-to-many supply network and on-to-one supply chain. The findings show that coordination is the major concern in supply chain research, while horizontal and vertical competitions are major concern in supply network research.

025-1011 Supply Chain Integration and its Effect on Performance: A Multi-Country Study

Arshad Alam, Assistant Professor, Prairie View A&M University, United States
Subrata Mitra, Professor, Indian Institute Of Management Calcutta, India
Bumsoo Kim, Student, George Washington University, United States
Prabir Bagchi, Professor, George Washington University, United States

Improved supply chain performance results in enhanced organizational competitiveness. This calls for a renewed focus on different factors affecting supply chain and logistics performance of an organization. While some factors such as degree and length of supplier involvement and use of information technology may be internal to an organization and supply chain, performance is also impacted by the overall locational environment as defined by infrastructure, absorptive capacity and supplier environment in which the firm operates. To analyze the impact of a country's overall supply environment along with that of individual factors on a firm's supply chain performance, data was collected on various supply chain measures from 187 corporations from Brazil, South Korea and India and analyzed. The study presents the results of the empirical study. Analysis is carried out to understand the role played by various supply chain factors including logistics integration on supply chain performance. Hypotheses are proposed and results of regressions are presented.

025-0335 Model to analyze inter-organizational relationships of production chains through the proposed indicators

Osmildo Santos, Professor, Universidade Nove De Julho, Brazil
Oduvaldo Vendrametto, Professor, Universidade Paulista - Unip, Brazil
Marcelo Okano, Professor, Federal Institute of Sao Paulo / faculty of technology of Barueri, Brazil

The goal of this research is to analyze the inter-organizational relationships of production chains through indicators proposed by the theories of fourth authors, identifying them in four areas: contingency factors, duality of collaboration, network characteristics and features of the supply chain and what benefits obtained by the chain organization.

238	Sunday, 01:00 PM - 02:30 PM, Watertower (Floor 10) <i>Session:</i> Topics in Supply Chain and Technology Management <i>Chair(s):</i> Zhixi Wan	<i>Track:</i> Vendor and Supply Contracts
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025-0602 Impact of Regulatory Changes on New Product Design Choice and End-of-Life Inventory Buildup

Ananth Iyer, Professor, Purdue University, United States
Mohammad Saoud, Student, Purdue University, United States
Svenja Sommer, Assistant Professor, Hec Paris, France

Environmental regulations impose strict standards on manufacturers, requiring them to redesign products and cease production of older versions by a specific date. We consider the design choice and its effect on the inventory build-up of the old product, exploring the effects of product, customer and industry characteristics on manufacturers' choices.

025-1100 Offshore Contract Performance for Knowledge Work: Integrating Transactional and Relational Perspectives

Shirish C. Srivastava, Assistant Professor, Hec Paris, France
Thompson S.H. Teo, Associate Professor, National University Of Singapore, Singapore

By distinguishing between 'contract specification' and 'contract governance' we integrate transactional and relational perspectives for examining offshore contract performance. Specifically, we posit that a well specified contract coupled with appropriate contract governance mechanisms influence multiple operational performance outcomes namely, knowledge integration between client and vendor, output quality and cost performance.

025-1446 Collaborative Prototyping with Asymmetry Cost Information

Timophe Shalpegin, Student, Hec Paris, France
Svenja Sommer, Assistant Professor, Hec Paris, France

Zhixi Wan, Assistant Professor, Hec Paris, France

Manufacturers increasingly collaborate with suppliers for component innovations. Since component costs are often known only to suppliers, this raises the question how to best incentivize the supplier to provide the best performing components. We examine the performance of several simple contracts when collaboration is realized in form of sequential prototyping.

025-1283 Analysis of a Capacitated Two-Suppliers and One-Retailer Supply Chain Problem

Kai Luo, Student, University Of Toronto, Canada
 Laoucine Kerbache, Professor, Hec Paris, France
 Bollapragada Ramesh, Associate Professor, San Francisco State University, United States

We consider the case of a supply chain made up of one retailer sourcing a first product from a low-cost supplier and a second product from a high-cost supplier. Two resulting main multi-period problems are analyzed. Optimal and heuristic solutions are discussed and managerial insights are provided.

239	Sunday, 01:00 PM - 02:30 PM, Ballroom F (Floor 5) <i>Track:</i> Product Innovation and Technology Management
	<i>Session:</i> State of the Art and Next Steps for Managing Process Innovation Programs
	<i>Chair(s):</i> Morgan Swink

025-1709 Panel Session: State of the Art and Next Steps for Managing Process Innovation Programs

Robert Klassen, Professor, University Of Western Ontario, Canada
 Morgan Swink, Professor, TCU, United States
 Barbara Flynn, Professor, Indiana University, United States
 Wallace Hopp, Professor, University Of Michigan Ann Arbor, United States
 Enno Siemsen, Assistant Professor, University Of Minnesota, United States

Many firms report tremendous gains from innovation programs such as Lean, Six Sigma, Sustainability, and the like. In this interactive session we will hear from top process innovation researchers regarding what we currently know about successfully managing such programs, and opportunities for future research.

240	Sunday, 01:00 PM - 02:30 PM, Los Angeles (Floor 5) <i>Track:</i> Production Planning and Scheduling
	<i>Session:</i> Green Products and Green Production: Innovations, Challenges and Strategies
	<i>Chair(s):</i> Yu Xia

025-0630 Green Product Development with Competition and Technology Constraints: Models and Empirical Analyses

Chialin Chen, Associate Professor, Queens University, Canada

Theoretical and empirical analyses are performed to identify the conditions where green product development with competition and technology constraints can benefit the environment. The analytical results, which are empirically verified with industry data, show that environmental benefits depend on different competitive settings and functional forms of technology efficient frontiers.

025-0062 Green product innovation and market segmentation

Yu Xia, Associate Professor, Northeastern University, United States

We investigate a market with two competitive suppliers and many buyers. The suppliers invest in both traditional technology and green technology. Their investment allocations determine their product's traditional quality level and the green quality level, and hence change their market segmentation among buyers with different preference levels of green technology.

025-1691 Governance mechanisms to support manufacturer's green production initiatives

Gilbert Nyaga, Assistant Professor, Northeastern University, United States

Manufacturers are increasingly investing in green products to meet growing demand and regulatory requirements. Manufacturers need to involve supply chain partners partly because sourced components and supporting logistics processes affect the "greenness" of their products. This study examines supply chain governance mechanisms that manufacturers can use to support green initiatives.

025-0078 The Design of Green Product: The Impact of Development Cost

Victor Shi, Assistant Professor, Wilfrid Laurier University, Canada
 Xuan Zhao, Associate Professor, Wilfrid Laurier University, Canada
 Maryam Hafezi, Student, Wilfrid Laurier University, Canada

In this paper, we model the possible tradeoffs when designing green products by considering development costs. We show that how development costs impact the traditional and environmental qualities of a product. We also show the conflict between financial performance and environmental performance.

025-0491 Price Competition for Retailers with Profit and Revenue Targets

Victor Shi, Assistant Professor, Wilfrid Laurier University, Canada

Price competition for retailers has been extensively studied in the literature assuming the objective of (expected) profit maximization. In this paper, we make a major contribution by studying price competition for retailers with both profit and revenue targets. Consequently, each retailer adopts the satisficing objective.

241	Sunday, 01:00 PM - 02:30 PM, Northwestern (Floor 6) <i>Track:</i> Supply Management
	<i>Session:</i> Supply Chain Research
	<i>Chair(s):</i> Luiz Brito

025-0681 Continuous improvement capability and supply risk perception on supplier evaluation

Guilherme Martins, Student, Fundacao Getulio Vargas, Brazil
 Luiz Carlos Di Serio, Professor, Fundacao Getulio Vargas, Brazil
 Roberto Sedyama, Student, Fundacao Getulio Vargas, Brazil

The objective of the paper is to identify the relation between supplier's continuous improvement capabilities and perception of supply risk from the supplier evaluation. The continuous improvement as a capability and the perception of supply risk can serve as an antecedent of the supplier development program by the evaluation process.

025-1053 A Data Envelopment Analysis Approach for Supplier Selection
Fariborz Partovi, Professor, Drexel University, United States

Traditionally sourcing decision is based on operational metrics. In recent years there is more emphasis in long term relation with suppliers, in this research we suggest a model for supplier selection that takes into account both product characteristic data as well as process capability of supplier.

025-1034 Relational resource - Does it create value?
Priscila Miguel, Student, Eaesp - Fgv, Brazil
Luiz Brito, Professor, Fundacao Getulio Vargas, Brazil

Based on 31 qualitative interviews and supported by a survey, the study provides evidences on how value is created and appropriated in a buyer-supplier relationship. Benefits and investment differ depending on bargaining power and the value capture by each member happens in a dynamic and sequential cycle.

025-1609 A joint cutting and inventory control system for a plastic rolls manufacturer in the pharmaceutical industry
Eric Porras, Professor, Tecnologico de Monterrey, Mexico
Juan Cantú, Manager, Novaprint, Mexico

Manufacturers of plastic rolls supplying the pharmaceutical industry are typically constrained by high service levels and long lead times. In this paper we look at a cutting-stock problem combined with an inventory control system for raw materials supporting production of plastic rolls. The proposed methods are evaluated using real data.

242	Sunday, 01:00 PM - 02:30 PM, Ballroom C (Floor 5) <i>Session:</i> Empathy and Operations in Healthcare <i>Chair(s):</i> Anita Tucker	<i>Track:</i> Healthcare Operations
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025-0520 Process Management Impact on Clinical & Experiential Quality: Productivity Dilemma Revisited
Claire Senot, Student, Ohio State University, United States
Kenneth Boyer, Professor, Ohio State University, United States
Aravind Chandrasekaran, Assistant Professor, Ohio State University, United States

This research investigates the effect of process management on clinical and experiential quality. We argue for a tradeoff between clinical and experiential quality as hospitals emphasize process management. We also study how healthcare regulations and hospital leadership influence this tradeoff using a combination of primary and secondary data.

025-1442 Designing service processes to delivery psychological outcomes
Sriram Dasu, Associate Professor, University Of Southern California, United States

Emotions or more broadly feelings shape our perceptions, memories, and summary judgments. Factors that drive feelings can be linked to processes and operational activities. This makes it possible to "design" processes and structure information to improve customer experiences. A few cases in healthcare will be used to illustrate this approach.

025-1781 Patient Experience as a competitive differentiator at Cleveland Clinic
James Merlino, Chief Experience Officer, Cleveland Clinic Health System, United States

Hospitals must provide high quality, safe care; however executing on a strategy to enhance the patient experience and maintain fiscal sustainability creates operational challenges. We will present how Cleveland Clinic has leveraged patient experience as a competitive differentiator by implementing process improvement and culture change to achieve its goals.

025-1780 Teaching about customer experience in a service operations course
Ananth Raman, Professor, Harvard University, United States
Anita Tucker, Associate Professor, Harvard University, United States

We present a new teaching case that enables students to debate the challenges and benefits of delivering excellent customer experience. The case describes the events leading up to The Cleveland Clinic's decision to create an Office of Patient Experience and its subsequent efforts to improve patient experience.

243	Sunday, 01:00 PM - 02:30 PM, Kansas City (Floor 5) <i>Session:</i> Outpatient Appointment Management <i>Chair(s):</i> Yichuan Ding	<i>Track:</i> Healthcare Operations
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025-0908 The Impact of Case Mix on Timely Access to Appointments for a Primary Care Physician
Hari Balasubramanian, Assistant Professor, University Of Massachusetts Amherst, United States
Asli Ozen, Student, University Of Massachusetts Amherst, United States

A primary care physician's panel refers to the patients whose long term care the physician is responsible for. Using patient-level data from Mayo Clinic (Rochester, MN), we quantify the impact of panel size and case-mix on the ability of a multi-physician practice to provide timely access to appointments.

025-1297 Outpatient appointment sequencing and scheduling under uncertainty
Melvyn Sim, Associate Professor, National University Of Singapore, Singapore
Jin Qi, Student, National University Of Singapore, Singapore

This study distinguishes the outpatients into different types according to their service time distribution, and tolerable waiting time. Given the number of patients, we consider the sequencing and scheduling problem simultaneously by maximizing the confidence level such that the Conditional Value-at-Risk of waiting time is less than their tolerable time.

025-1315 Dynamic patient scheduling with general overtime cost

Yichuan Ding, Student, Stanford University, United States
 Guanlian Xiao, Student, Shanghai Jiao Tong University, China
 Dongdong Ge, , Shanghai Jiao Tong University, China

We consider dynamically scheduling patients with multi-priorities to a diagnostic facility with a general convex overtime cost function. We present a dynamic programming approach, investigate its solution structure, and propose efficient algorithms to solve some important cases.

025-1121 A Time-Dependent Booking Limit Policy for Scheduling Follow-up Appointments

Ching-Hua Chen-Ritzo, Research Scientist, IBM, United States
 Mayank Sharma, Research Staff, IBM, United States
 Yichuan Ding, Student, Stanford University, United States

In an outpatient setting, patients arriving for a single appointment may unexpectedly find that they must return for one or more follow-up appointments. Existing models for scheduling outpatient appointments have not considered such follow-up appointments. This paper models this phenomenon and presents optimal scheduling policies for efficiently accommodating follow-up visits.

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Sunday, 01:00 PM - 02:30 PM, Wisconsin (WI) (Floor 6) *Track:* Retail Operations
Session: Alliance Formation in Retail Supply Chains
Chair(s): Saibal Ray Sumit Kunnumkal

025-0565 Randomization Approaches for Network RM with Choice Behavior

Sumit Kunnumkal, Assistant Professor, Indian School Of Business, India

We present new approximation methods for the network RM problem with customer choice. The starting point for our methods is a dynamic program that allows randomization. We present two approximation methods that build on this dynamic program and use ideas from the independent demands setting.

025-0727 Joint Selling among Complementary Suppliers in a Supply Chain with Competing Brands and Retailers

Shuya Yin, Associate Professor, University Of California Irvine, United States
 Yuhong He, Student, University Of California Irvine, United States

Suppliers of complementary goods often engage in joint selling of their components to downstream retailers. This paper aims to understand how competition among partially substitutable brands for components and/or competition among retailers in selling final products shape such cooperative behaviors.

025-0754 Stability and Endogenous Formation of Inventory Transshipment Networks

Xin Fang, Student, Carnegie Mellon University, United States
 Soo-Haeng Cho, Assistant Professor, Carnegie Mellon University, United States

This paper studies inventory transshipment based on networks of multiple firms. Firms make inventory decisions independently, and then decide collectively how to transship excess inventories. Using the theory of economic and social networks, we examine stability of various networks, and then establish equilibrium networks when networks are formed endogenously.

025-0767 Vertical mergers and inventory management performance

Jing Zhu, Student, Mcgill University, Canada
 Tamer Boyaci, Associate Professor, Mcgill University, Canada
 Saibal Ray, Associate Professor, Mcgill University, Canada

We analyze the effects of vertical mergers on acquiring firms' performance. We concentrate on sectors where inventories play a significant role, i.e., manufacturing, wholesale and retail industries, and our primary focus is on inventory-related metrics. By using accounting data, we study how acquirers' performance changes over five years after mergers.

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Sunday, 01:00 PM - 02:30 PM, River North (Floor 2) *Track:* OM in Latin America and the Caribbean
Session: OM in Agrifood
Chair(s): Sergio Maturana Valderrama

025-0812 Technological Capability of Brazilian Aircraft Maintenance

Ligia Soto Urbina, Professor, Instituto Tecnológico De Aeronautica, Brazil
 Marcio Machado, Professor, Instituto Tecnológico De Aeronautica, Brazil

In Brazil, the expansion of air transport industry requires the support of aircraft maintenance sector. Thus, this paper's objective is to visualize the maintenance sector's technological capability, analyzing its expertise based on their current technical competence, and providing insights on its managerial capability and its ability to provide new services.

025-0184 Adoption of technological and managerial requirements to export beef to the EU: a study of Brazilian farms

Marcela Vinholis, Researcher, Brazilian Agricultural Research Corporation (Embrapa), Brazil
 Hildo Souza Filho, Associate Professor, Universidade Federal De São Carlos, Brazil
 Marcelo Carrer, Student, Universidade Federal de São Carlos, Brazil

A sample of 83 cattle beef farms provided data to test hypotheses on economic and non-economic factors. A bivariate logit statistic model was used. It was found that high capital intensity, large scale, previous experience with certification, and farmers' experience, measured by age, play a positive role in the adoption.

025-0518 Evaluation of the profile of the Brazilian consumer of organic food: an analysis of the market and company

Edson Paladini, Associate Professor, Universidade Federal de Santa Catarina, Brazil
 Cristiane Anacleto, Student, Universidade Federal de Santa Catarina, Brazil

This study aimed to identify how close is the knowledge of Brazilian companies producing organic foods on consumers of these products. It is concluded that the Brazilian producers know the reason for the consumption of their products and have some elements that consumers point out important.

025-1686 Benefits and costs of a postponement strategy for a wine producer

Sergio Maturana Valderrama, Professor, Pontificia Universidad Católica De Chile, Chile

Pamela Carrillo, Student, Pontificia Universidad Catolica De Chile, Chile

The benefits and cost of using a postponement strategy are analyzed in the case of an important Chilean wine producer using a linear programming model. The postponement strategy is applied to the labeling process. Once the bottle is labeled, the countries to which the bottle can be sold are limited.

246	Sunday, 01:00 PM - 02:30 PM, Cook (Floor 3) <i>Track:</i> Supply Chain Risk <i>Session:</i> Operational Flexibility in Managing Supply Chain Risks 2 <i>Chair(s):</i> Xiuli He
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025-0169 Quick Response Strategies for Substitutable Resources After Demand Forecast Changes

James Dyer, Professor, University Of Texas Austin, United States
 Saurabh Bansal, Assistant Professor, Penn State University University Park, United States

We show the existence of simple rules that are also analytically optimal for managers to update the inventory levels, expected profit, fill rates, and service levels for substitutable resources, when the demand forecasts of these resources change.

025-0868 Inventory Risk and Hedging

Sridhar Seshadri, Professor, University Of Texas Austin, United States
 Kumar Muthuraman, Associate Professor, University Of Texas Austin, United States
 Qi Wu, Student, University Of Texas Austin, United States

We investigate how inventory decisions are affected by the cost of financing inventories. Typically there are two ways to finance the inventory: using borrowed funds from a bank or using trade credit extended by suppliers. We examine how the firm's cost of capital and availability of credit affect inventory decisions.

025-1012 An algorithmic analysis of impact of order Splitting on safety stock

Shenghan Xu, Assistant Professor, University Of Idaho, United States
 Li Tan, Assistant Professor, Washington State University, Tri-Cities, United States

We propose a formal analysis technique that algorithmically analyzes the impact of order splitting on safety stock. Using our proposed probabilistic model checking-based technique and Markov Decision Process-based formal stochastic models, we validate the benefit of order splitting on safety stock and identify the key factors that affect such benefits.

025-1306 Risk Analysis of Non-supply of New Products: Application of Fuzzy Logic

Juliana Achcar, Student, Centro Universitario da FEI, Brazil
 Antonio Saurin Junior, Student, Centro Universitario da FEI, Brazil
 Mireille Santos, Student, Centro Universitario da FEI, Brazil
 Joao Chang Junior, Professor, Centro Universitario Da Fei, Brazil

Objective is to analyze the risks of not supplying products using fuzzy methodology. Applied to multinational cosmetics with sales of USD 10 billion/year; the lack of product reduce the service level. The results confirm the importance of risk management and the superiority of fuzzy over the methodology proposed by the PMBOK.

247	Sunday, 01:00 PM - 02:30 PM, Ballroom G (Floor 5) <i>Track:</i> Service Operations <i>Session:</i> Approximate Dynamic Programming in Service Operations <i>Chair(s):</i> Christiane Barz
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025-1093 An Approximate Dynamic Programming Approach to Air Cargo Revenue Management

Rainer Hoffmann, Student, Karlsruhe Institute of Technology, Germany
 Christiane Barz, Assistant Professor, University Of California Los Angeles, United States

We present efficient heuristics that solve the air cargo capacity control problem. The linear programming approach is used to approximate the value function of the underlying Markov decision process. As the resulting LP features an excessive number of constraints, we provide a column generation procedure for solving its dual.

025-1139 Approximate dynamic programming for routing a service vehicle

Stephan Meisel, Assistant Professor, Technische Universitat Braunschweig, Germany

We propose an approximate dynamic programming approach to dynamic routing of a service vehicle with stochastic customer requests. Each of the requests must either be accepted or rejected as soon as it occurs. The overall goal is serving as many customers as possible within the given period of time.

025-0199 Patient Admissions under Multiple Resource Constraints

Kumar Rajaram, Professor, University Of California Los Angeles, United States
 Christiane Barz, Assistant Professor, University Of California Los Angeles, United States

We consider a patient admission problem to a hospital with two potential bottlenecks: beds and OR capacity. While there is an uncontrolled arrival process of emergency patients, the hospital has the freedom to postpone or even reject the admission of non-emergency patients.

248	Sunday, 01:00 PM - 02:30 PM, Miami (Floor 5) <i>Track:</i> Capacity Management <i>Session:</i> Capacity Planning in Services and Manufacturing Systems <i>Chair(s):</i> Noam Shamir
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025-0504 Staffing Multiclass Service Systems: Problem Formulations and Consistency Constraints

Seung Bum Soh, Student, Kellogg School of Management, United States
 Itai Gurvich, Assistant Professor, Northwestern University, United States

With multiple customer classes, the problem of minimizing staffing costs subject to quality of service targets raises conceptual issues already at the formulation stage. We study this question of formulation choice by introducing a notion of consistency amongst customer classes and examining its implications on staffing and prioritization.

025-1166 Asymmetric Forecast Information and the Value of Demand Observation in Repeated Procurement

Noam Shamir, Northwestern University, United States

We study a supply chain comprised of a retailer sourcing a product from a manufacturer over multiple periods. The retailer has superior information about the market, and the manufacturer can observe during each period the realized demand. We analyze how demand availability affects the contract terms in this dynamic setting.

025-1171 Impact of Downstream Competition on Innovation in a Supply Chain

Jingqi Wang, Student, Northwestern University, United States
Hyoduk Shin, Assistant Professor, Northwestern University, United States

We explore the impact of downstream competition on upstream innovation in a supply chain. We show that this impact depends on the contract form used in the industry. We also demonstrate that all firms within a supply chain can be better off by giving the supplier more channel power.

025-0534 Pricing and Scheduling with Multiple Products and Competing Manufacturers

Zehra Yalcin, Student, Koc University, Turkey
Selcuk Karabati, Professor, Koc University, Turkey

We consider a pricing and scheduling problem with multiple competing suppliers having limited capacities and buyers interested in their bundles only. We investigate the centralized problems in which the bundle splitting is allowed and not allowed in the presence of full information sharing as well as the versions with pricing.

249	Sunday, 01:00 PM - 02:30 PM, Minnesota (MN) (Floor 6) <i>Track:</i> Inventory Management
	<i>Session:</i> Inventory Allocation
	<i>Chair(s):</i> Chun-Miin Chen

025-1307 Criteria for a warehouse design tool with optimal storage/retrieval and product-allocation procedures

Andrea Fumi, Student, University Of Rome - Tor Vergata, Italy
Massimiliano Schiraldi, Assistant Professor, University Of Rome - Tor Vergata, Italy
Laura Scarabotti, Student, University Of Rome - Tor Vergata, Italy

This paper presents the design criteria for a software tool able to support warehouse planning; minimizing both the overall required space and internal travel times. The tool allows what-if analysis on different slot-product allocations and stacking/picking scenarios, implementing either optimal or random products allocation with single or multiple command modes.

025-0609 Managing an Integrated Production Inventory System with Information on the Production and Demand Status

Herve Camus, Associate Professor, Ecole Centrale de Lille, France
Etienne Craye, Professor, Ecole Centrale de Lille, France
Mohsen Elhafsi, Professor, University of California, United States

We study a system consisting of a manufacturer producing a standard product in anticipation of orders emanating from n clients with different contractual agreements. The objective is to determine the optimal production/inventory allocation policies. We show that the optimal inventory allocation is state dependent rationing policy.

025-0277 Inventory Allocation Methods and Service Level Agreements

Chun-Miin Chen, Student, Penn State University University Park, United States
Doug Thomas, Associate Professor, Penn State University University Park, United States

Firms may employ a variety of methods to allocate scarce supply to meet multiple customer demands. We examine the impact to customer service levels of different allocation methods both analytically and computationally. We find substantial differences in customer service performance across different allocation rules.

250	Sunday, 01:00 PM - 02:30 PM, Indiana (Floor 6) <i>Track:</i> Teaching in OM
	<i>Session:</i> Responsive Learning Technologies: Interactive Game
	<i>Chair(s):</i> Sam Wood

025-1823 Play an award-winning online game used to teach Operations Management

Sam Wood, President, Responsive Learning Technologies, United States

In 2004 POMS awarded the Wickham Skinner Award for Teaching Innovation for the development of a competitive online simulation-based assignment named Littlefield Technologies. Last year the game was used in introductory operations courses at the undergraduate, graduate, and executive level in hundreds institutions around the world. In this highly interactive session, participants will play an actual game compressed to 45 minutes. The session will also include discussion of how online games can be used effectively. Although not required, attendees are encouraged to bring a laptop to the session.

251	Sunday, 02:45 PM - 04:15 PM, Scottsdale (Floor 5)	<i>Track:</i> Behavioral Operations
	<i>Session:</i> Behavioral Experiments on Problem Solving in Operational Contexts	
	<i>Chair(s):</i> Enno Siemsen	

025-0535 The Effects of Problem Structure and Team Diversity on Brainstorming Effectiveness: An Experimental Investigation

Elliot Bendoly, Associate Professor, Emory University, United States
 Svenja Sommer, Assistant Professor, Hec Paris, France
 Stylianos Kavadias, Associate Professor, Georgia Institute Of Technology, United States

Kavadias and Sommer (2009) describe a normative model predicting strong collaborative group problem solving in relatively simple settings, but weakness in increasingly complex ones. We revisit the issue through a computer-based experiment. The value of the normative model is strengthened through the consideration of member diversity, focus, control and accountability.

025-0212 Illusionary Trend Detection in Time Series Forecasting

Mirko Kremer, Assistant Professor, Penn State University State College, United States
 Brent Moritz, Assistant Professor, Penn State University State College, United States
 Enno Siemsen, Assistant Professor, University Of Minnesota, United States

Behavioral experiments show that human forecasters are quick to detect trends in a time-series dataset where none exist. We examine how this behavior depends on underlying structural parameters of the time series, and the resulting performance implications.

025-0631 Inventory Control when Selling to Human Newsvendors

Jin Kyung Kwak, Student, Cornell University, United States
 yusen xia, Associate Professor, Georgia State University, United States
 Young-Hoon Park, Associate Professor, Cornell University, United States
 Srinagesh Gavirneni, Associate Professor, Cornell University, United States

Insights from behavioral studies in newsvendor decision making have, thus far, not been incorporated into supply chain decision making. We analyze supply chain models in which a supplier is selling to human newsvendors and demonstrate that knowledge of behavioral tendencies can reduce supply chain cost by as much as 30%.

025-0628 The Anatomy of Newsvendor Order Decisions

Yun Shin Lee, Student, University Of Cambridge, United Kingdom
 Enno Siemsen, Assistant Professor, University Of Minnesota, United States

We study the anatomy of a newsvendor order decision by decomposing it into point and distribution forecasts, service level decisions and actual order quantities. By identifying the source of decision bias in each component of this decision system, we propose bias-correcting strategies that may promote optimal stocking.

252	Sunday, 02:45 PM - 04:15 PM, Lincolnshire II (Floor 6)	<i>Track:</i> Empirical Research in OM
	<i>Session:</i> Empirical Research in OM II	
	<i>Chair(s):</i> Vidya Mani	

025-0405 Drivers and Consequences of Understaffing in Retail Stores

Saravanan Kesavan, Assistant Professor, University Of North Carolina Chapel Hill, United States
 Jayashankar Swaminathan, Professor, University Of North Carolina Chapel Hill, United States
 Vidya Mani, Assistant Professor, Penn State University University Park, United States

In this paper we study the drivers and consequences of understaffing in retail stores by examining store managers' labor-planning decisions in a large retail chain. We imputed their cost of labor and show that understaffing is predominantly present during peak hours, and forecast errors and scheduling inflexibilities contribute to understaffing.

025-0485 Reducing Flight Delays by Optimizing Block-time Allocation

Vinayak Deshpande, Associate Professor, University Of North Carolina Chapel Hill, United States
 Mazhar Arikan, Assistant Professor, University Of Kansas, United States
 Milind Sohoni, Associate Professor, Indian School Of Business, India

In this paper, we develop an approach to reallocate block-times across the network and analyze the trade-off between total network arrival delay minutes and network-wide block-time budget. Using data acquired from a major U.S. airline, we construct an efficient frontier by optimally allocating block-times while considering target on-time arrival probabilities.

025-1122 The Determinants of Vendor Compliance

Susan Kulp, Associate Professor, George Washington University, United States
 Nicole DeHoratius, Instructor, Zaragoza Logistics Center, United States

Non-compliant deliveries between vendors and retail partners are common. We identify several key drivers of non-compliance including the complexity of the purchase order, characteristics of the ordering process, the vendor contract, and financial incentives. In so doing, we propose ways retailers and vendors can work together to mitigate such errors.

025-1355 Empirical Analysis of the Relationship Between Sourcing Strategy and Performance

Nitish Jain, Student, INSEAD, Singapore
 Karan Girotra, Assistant Professor, INSEAD, France
 Serguei Netessine, Emeritus Professor, INSEAD, France

We use transactional data for US imports to analyze the relationship between import operations and performance of US public companies.

253	Sunday, 02:45 PM - 04:15 PM, Ohio State (Floor 6)	<i>Track:</i> Humanitarian Operations and Crisis Management
	<i>Session:</i> Public Policy and Humanitarian Aid, Some Lessons Learned	
	<i>Chair(s):</i> Koray Ozpolat	

025-1750 Re-designing the upstream emergency relief supply chain
 Koray Ozpolat, Assistant Professor, University Of Rhode Island, United States
 Dina Ribbink, Assistant Professor, University Of Western Ontario, Canada
 Robert Windle, Professor, University Of Maryland, United States

Using USAID's emergency food aid shipments data, we find that global sourcing offers significant benefits over sourcing only in the donor country. Sourcing location decisions should be based on the type of commodity as well as the geographic location and economic situation of the recipient country.

025-0445 Military Response to Inland Natural Disasters: The Case of Floods in Brazil
 Renata Bandeira, Assistant Professor, Instituto Militar de Engenharia, Brazil
 Vania Campos, Associate Professor, Instituto Militar de Engenharia, Brazil
 Adriano Bandeira, Assistant Professor, Instituto Militar de Engenharia, Brazil

As the field of Humanitarian Logistics is still incipient in Brazil, military support could help to ensure effectiveness for these operations. Therefore, the paper analyzes the immediate response operation after the floods occurred in Rio de Janeiro in 2011, focusing on the support provided by the Brazilian Army.

025-1388 The profile of the populations affected by natural disasters in Brazil
 Irineu Brito Jr, Student, Universidade De Sao Paulo, Brazil
 Bruno Kawasaki, Student, Universidade De Sao Paulo, Brazil
 Adriana Leiras, Assistant Professor, Universidade De Sao Paulo, Brazil
 Hugo Yoshizaki, Associate Professor, Universidade De Sao Paulo, Brazil

Disasters are calamitous events that disrupt community activities. The profile of the population affected by disasters differs according to disaster type and site vulnerability. In this study, the natural disaster's victims profile in Brazil is addressed. Statistical analysis is used to guide preventive activities for the population under risk.

025-1714 A Path-based Hazmat Model with Road Closure Time Windows
 Tijun Fan, Professor, East China University Of Science & Tehcnology, China
 Robert Russell, Professor, The University Of Tulsa, United States
 Wen-Chyuan Chiang, Professor, The University Of Tulsa, United States

About 4 billion tons of hazardous materials (hazmats) are transported annually worldwide. In this paper, we define risks associated with transporting hazmats and formulate the problem as a mixed integer programming problem. Examples are discussed.

254	Sunday, 02:45 PM - 04:15 PM, Purdue (Floor 6)	<i>Track:</i> Marketing and OM Interface
	<i>Session:</i> Supply Chain Competition and Marketing	
	<i>Chair(s):</i> Xiang Fang	

025-0769 A Strategic Analysis of Group-buying as a Promotional Tool
 Jun Cheng, Student, University of Science and Technology of China, China
 Qinglong Gou, Associate Professor, University Of Science & Technology, China
 Xiaohang Yue, Associate Professor, University Of Wisconsin Milwaukee, United States
 Liang Liang, Professor, University of Science and Technology of China, China

Group-buying is a promotional tool which can be quickly build and remove. This paper focuses the manufacturer and retailer's optimal promotion decision when they offer traditional price discount promotion and group-buying simultaneously. Whether the group-buying should be offered by the manufacturer or the retailer is analyzed.

025-0949 The Length of Product Line: When Specialty Retailers Meet Big-box Retailers
 Tao Chen, Assistant Professor, University Of Maryland, United States
 Jiong Sun, Assistant Professor, Illinois Institute Of Technology, United States

Compared with big-box stores, specialty stores carry fewer categories but more varieties in each category. When consumers are unsure about their taste, visiting specialty stores offers them an opportunity to inspect varieties and resolve uncertainty. We examine product variety decisions of specialty stores facing competition from big-boxes.

025-1028 Dynamic Co-op Advertising in a Competitive Assembly Supply Chain
 Qinglong Gou, Associate Professor, University Of Science & Technology, China
 Xiuli He, Assistant Professor, University Of North Carolina Charlotte, United States
 Juan Zhang, Student, University Of Science & Technology, China

This paper studies the cooperative advertising program used in an assembly supply chain in which the manufacturer procures the components from two competitive suppliers, assemble components into an end product and sells it to the consumers. We derive the optimal advertising efforts and participation rates under three different game scenarios.

025-1173 Analysis of Transactional Ticket Queue Data for Staffing Decisions
 Kaan Kuzu, Assistant Professor, University Of Wisconsin Milwaukee, United States

We consider the staffing policy for a multi-server Ticket Queue with multiple service types. Using the transactional data from a bank, we estimate system parameters such as customers' patience times and abandonment rates. We propose an algorithm facilitating dynamic staffing decisions and benchmark the bank policy with the proposed policy.

025-1504 Contract Design in Anticipation of Retailers' Noncompliance Risk
 Xuemei Su, Assistant Professor, California State University Long Beach, United States

Samar Mukhopadhyay, Professor, GSB- SungKyunKwan University, Korea, Republic of (South Korea)
Linda(Xiaowei) Zhu, Associate Professor, West Chester University of PA, United States

Linear Quantity Discount contract and Grove Wholesale Price contract are compared in their role of coordinating a supply chain with asymmetric power distribution, and of fighting channel-flow-diversion type of gray trading between the dominant retailer and the fringe retailers. Their effect on truthful information revelation is also studied.

255	Sunday, 02:45 PM - 04:15 PM, Great America II (Floor 6) <i>Track:</i> OM Practice <i>Session:</i> Operations Management and Finance Interface II <i>Chair(s):</i> Ankur Goel
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025-0267 Integrated Options and Spot Procurement for Commodity Processors
Fehmi Tanrisever, Assistant Professor, Eindhoven University of Technology, Netherlands
Ankur Goel, Assistant Professor, Case Western Reserve University, United States

We consider a commodity processor that procures a commodity through a combination of options and spot contracts. We characterize the optimal policy for options purchase and exercise. We show that the value of procurement through options contract increases with demand volatility and decreases with price volatility.

025-0992 Operational Flexibility and Valuation of Oil Refinery Operations
Sripad Devalkar, Assistant Professor, Indian School Of Business, India
Ankur Goel, Assistant Professor, Case Western Reserve University, United States

In this paper, we present a stochastic DP to model the interconnections between the input (crude) procurement and output product mix decisions, conditional on the input and output market prices and the refinery's operational flexibility in blending different grades of crude oil and adjusting the mix of output products produced.

025-1045 Managing Growth and Bankruptcy Risk for a Cash Constrained Firm
Yasin Alan, Student, Cornell University, United States
Vishal Gaur, Associate Professor, Cornell University, United States

A cash constrained firm has to balance growth and bankruptcy risk. We study the effects of this tradeoff by setting up a finite horizon cash-constrained inventory model with non-stationary demand. We address questions such as whether growth requires investing more than the myopic optimal and whether it increases bankruptcy risk.

257	Sunday, 02:45 PM - 04:15 PM, Ballroom A (Floor 5) <i>Track:</i> Sustainable Operations <i>Session:</i> Capital Budgeting and Investment <i>Chair(s):</i> Gilvan Souza
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025-0190 Capacity Investment Decisions with Multiple Competing Technologies: A Portfolio Approach
Mark Ferguson, Professor, University Of South Carolina, United States
Shanshan Hu, Assistant Professor, Indiana University Bloomington, United States
Wenbin Wang, Student, Indiana University, United States
Gilvan Souza, Associate Professor, Indiana University, United States

Sustainable technologies typically require a higher upfront investment but have a lower operating (fuel) cost. The investment decision is difficult because of uncertainty in fuel prices and demand. We consider the firm's investment in a portfolio of technologies when demand and fuel costs are stochastic and possibly dependent.

025-0207 Energy Efficiency: Picking up the Twenty Dollar Bill
Chonnikarn Jira, Student, Harvard University, United States
Deishin Lee, Assistant Professor, Harvard University, United States

Although numerous studies have shown that energy efficiency can be profitable for the firm and reduce environmental impact, the adoption of energy efficiency projects has been slow. We study how the capital budgeting process hinders the adoption of these projects and mechanisms that can increase their adoption.

025-0542 Compliance Levers, Environmental Performance, and Firm Performance under Cap and Trade Regulation
James Kroes, Assistant Professor, Boise State University, United States
Ramanath Subramanyam, Assistant Professor, University Of Illinois Urbana-Champaign, United States
Ravi Subramanian, Assistant Professor, Georgia Institute Of Technology, United States

We consider the context of stringent cap and trade regulation with emissions allowance grandfathering and examine the relationships among: (1) levers for compliance (at-source pollution prevention, end-of-pipe pollution control, and the use of allowances); (2) environmental performance in terms of the targeted pollutant; and (3) firm market performance.

258	Sunday, 02:45 PM - 04:15 PM, Denver (Floor 5) <i>Track:</i> Sustainable Operations <i>Session:</i> Labor, Safety, & Energy Consumption <i>Chair(s):</i> Peter Ball
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025-0220 A documentary review in order to identifying the relationship between labour and sustainability in operations
Claudio Brunoro, Student, Universidade De Sao Paulo, Brazil
Laerte Sznelwar, Assistant Professor, Universidade De Sao Paulo, Brazil
Ivan Bolis, Student, Universidade De Sao Paulo, Brazil

The topic labour is mentioned from the earliest officially United Nations' documents related to sustainability. However, their approach has been done differently over time. Thus, this paper presents a revisit of sustainability documents, with the intention of identifying the relationship between work and sustainability in these documents.

025-0549 Improving Operational Performance Through Safety Practices: The Role of Workers

Sharvani Sharma, Student, York University, Canada
Mark Pagell, Professor, York University, Canada

Using literature on worker safety behavior and theories on self-determination and expectancy, this paper studies the relationships between safety practices and safety and operational performance. We propose and empirically test a model where worker compliance and participation mediate the relationship between safety practices and safety and operational performance.

025-1294 Impact of low energy production on scheduling and flow

Peter Ball, Senior Lecturer, Cranfield University, United Kingdom

Reduction in energy use is complementary to the classic lean production philosophy and the lean and green literature implies that reducing energy waste supports lean objectives. This paper examines and challenges this perceived positive correlation and identifies the impact level of energy reduction of lean product scheduling and flow.

259	Sunday, 02:45 PM - 04:15 PM, Ballroom H (Floor 5)	<i>Track:</i> Teaching in OM
	<i>Session:</i> An International Perspective	
	<i>Chair(s):</i> Joao Santos	

025-1402 Proposal and Evaluation of a Business Game: A case on Autonomous University of Lisbon

Rolf Erdmann, Professor, Universidade Federal De Santa Catarina, Brazil
Janaina Piana, Student, Universidade Federal De Santa Catarina, Brazil

The business games allow the student to integrate theory and practice. This article evaluated a Business Game created by authors. The results showed that the practice of the game increases the theoretical basis and supports students' learning, but winning is not important factor correlated to learning.

025-1082 Analysis of the teaching-learning process of Operation Management under the Bologna Scheme

Juan Carlos Rubio-Romero, Associate Professor, University Of Malaga, Spain
Salvador Perez-Canto, Assistant Professor, University Of Malaga, Spain
Jorge Maderna-Fernandez, Student, University Of Malaga, Spain
Alberto Albahari, Student, University Of Malaga, Spain

The Bologna Scheme is changing the way university subjects are taught in Europe. We have to modify the teaching-learning process in terms of syllabus, methodology, etc. This study is focused on how to redesign the subject of Operation Management to improve the work of teachers and the results for students.

025-1371 Aspects of information security in the industrial enterprises installed in a São Bernardo do Campo

Joao Santos, Student, Universidade Metodista De Sao Paulo, Brazil
Eduardo Santos, Student, Universidade Metodista De Sao Paulo, Brazil
Getulio Akabane, Student, Unia- Anhanguera, Brazil
Emerson Beneton, Sócio Gerente, ABC TEC - Tecnologia, Brazil
Luciano Gaspar, Student, Pontifica Universidade Catolica de Sao Paulo, Brazil

This is a field survey which tried to understand how the industrial enterprises of Sao Bernardo do Campo region, protect their own data and knowledge, through information technology tools available into the market. The results of study will be analyzed and presented as decision making tools for those enterprises.

025-1378 Increase in production and consumption and ethics in teaching and research in OM

Joao Santos, Student, Universidade Metodista De Sao Paulo, Brazil
Dagmar De Castro, Professor, Universidade Metodista De Sao Paulo, Brazil
Valquiria Da Silva, Student, Universidade Metodista De Sao Paulo, Brazil
Elen Da Silva, Student, Universidade Metodista De Sao Paulo, Brazil
Luciana Demarchi, Student, Universidade Metodista De Sao Paulo, Brazil

Research shows that increased production must be based on need and population growth, this requires changes in teaching and research in OM, so you have more ethics and concern for the preservation of the environment, generating employment, income and economic growth

025-1411 Teaching of Production Management: A Theoretical-Empirical Contribution

Sergio Brun, Student, UFGD/UFSC, Brazil
Rolf Erdmann, Professor, Universidade Federal De Santa Catarina, Brazil

A difficult issue in education has always been critical to educate people and prepared for market. In this study ways to address teaching and learning in order to uncover the foundations of the learning process that allows the development of more effective knowledge management in Management courses.

260	Sunday, 02:45 PM - 04:15 PM, Illinois (IL) (Floor 6)	<i>Track:</i> General Track
	<i>Session:</i> OM & IT Surveys, Project & Customer Service Management	
	<i>Chair(s):</i> Qazi Kabir	

025-0526 Maximizing Returns on Corporate Knowledge: Redefining Customer Support Policies

Nikhat Afshan, Student, University Of Memphis, United States
Shawn Jones, Assistant Professor, University Of Memphis, United States

Manufacturers face challenging decisions when developing customer support strategies capable of meeting market demands while maintaining cost effectiveness. This research suggests strategies firms employ to align support with product position. Further, this research recommends opportunities to leverage knowledge gained during product development and manufacturing to improve profits and customer support.

025-0530 Economic Sociology on OM Field: An Emerging Agenda

Enise Santos, Professor, Faculdade Anhanguera, Brazil
Cristiane Villar, Student, Fundacao Getulio Vargas, Brazil

This study investigates how Economic Sociology can contribute to theory building on OM field and how deep authors have been exploring this theory. By developing a structured literature review, the findings show that Economic Sociology can support OM field to respond to the complexities of today's OM challenges.

- 025-1530** IT as Companies Decision Making Tools: A Field Survey
 Eduardo Santos, Student, Methodist University, Brazil
 Joao Santos, Professor, Universidade Metodista De Sao Paulo, Brazil
 Emerson Beneton, Student, Unip, Brazil
 Camila Lopes, Student, Unisantos, Brazil
 Getulio Akabane, Student, Unia- Anhanguera, Brazil

Technology re-defines opportunities and its adoption provides executives the chance to explore these opportunities, since it produces new capacities to enterprise getting in. The study aims to survey companies in São Paulo-Brazil on how they are planning IT resources to remain competitive in an information based business environment.

- 025-1481** Historical analysis of team working development
 Fernando Almada Santos, Assistant Professor, Universidade De Sao Paulo, Brazil
 Verica Paula, Assistant Professor, Universidade de São Paulo (USP) and Universidade Federal de Uberlândia (UFU), Brazil

As organizations have to deal with global competition in a complex environment, new ways of organizing have emerged. This paper aims to propose a historical analysis of team work development. It begins with the initial studies of Scientific Management and ends with current concepts of team work.

- 025-1545** Evaluation of Project Management Scheduling Techniques: Comparing CPM and Critical Chain Project Management
 Kevin Watson, Assistant Professor, Iowa State University, United States
 Qazi Kabir, Student, Iowa State University, United States
 Theekshana Somaratna, Student, Iowa State University, United States

Previous research is divided on the relative benefits of critical path method and critical chain project management. We propose to evaluate the effectiveness of the two methods in terms of on time project completion, using simulations of networks of varying network and resource characteristics.

261	Sunday, 02:45 PM - 04:15 PM, Ballroom B (Floor 5)	<i>Track:</i> Supply Chain Management
	<i>Session:</i> Empirical Supply Chain Management	
	<i>Chair(s):</i> Elliot Rabinovich	

- 025-0108** Literature review of empirical studies on SCM using the SSPP paradigm
 Mikihisa Nakano, Associate Professor, Kyoto Sangyo University, Japan
 Takuya Akikawa, Assistant Professor, Nihon University, Japan

This study reviewed empirical literature on the relationship between strategy, structure, and/or processes in supply chains and performance. As a result, we found that most of the papers reviewed in this study have focused on the relationship between supply chain processes and performance.

- 025-1613** The State of Empirical Research in Logistics: Revisited
 A. Knemeyer, Associate Professor, Ohio State University, United States
 Elliot Rabinovich, Associate Professor, Arizona State University Tempe, United States
 Nada Sanders, Professor, Lehigh University, United States
 Stephan Wagner, Professor, Swiss Federal Institute Of Technology Zurich, Switzerland
 Thomas Goldsby, Professor, Ohio State University, United States
 Chad Autry, Associate Professor, University Of Tennessee Knoxville, United States

This session revisits a session from the 2010 POMS conference that reviewed Logistics research and devised new directions for the discipline. The presenters from that session gather again to revisit the topic with a fresh look on critical developments related to topical coverage, methods, data sources, replication, and meta-analysis.

- 025-1350** Measuring National Level Logistics Costs - Analyzing Worldwide Empirical Evidence
 Lauri Ojala, Professor, Turku School Of Economics, Finland
 Harri Lorentz, Assistant Professor, Turku School Of Economics, Finland
 Karri Rantasila, Student, Turku School Of Economics, Finland

Valid indicators for national level logistics costs are critical for policymaking and business, but reliable data is scarce. Some national studies exist, but comparability is poor. There is need for improved reliability, validity and comparability of findings. Analysis of the latest empirical evidence and a related World Bank initiative.

- 025-0976** The Difference of Agility and Adaptability in Supply Chains: An Empirical Analysis
 Michael Henke, Professor, Ebs Business School, Germany
 Constantin Blome, Assistant Professor, Université® Catholique De Louvain, Belgium
 Dominik Eckstein, Student, Ebs Business School, Germany

In order to stay competitive firms have to react fast and anticipate changes early. Based on a large scale survey with multiple respondents we examine antecedents and performance effects of supply chain agility and supply chain adaptability, and their relationship. Both dimensions can result in competitive advantages depending on contingencies.

- 025-1335** World Bank's Logistics Performance Index LPI 2012 - Connecting to Compete
 Jean-Francois Arvis, Sr. Economist, The World Bank, United States
 Monica Mustra, Expert, The World Bank, United States
 Lauri Ojala, Professor, Turku School Of Economics, Finland
 Daniel Saslavsky, Expert, The World Bank, United States

WB's Logistics Performance Index is the best data source on 155 countries' trade logistics performance covering the entire supply chain. A worldwide survey of 1,000+ logistics professionals already conducted in 2007 and 2010. LPI 2012 is released in Q1/12; this new data compared with the two previous ones.

262	Sunday, 02:45 PM - 04:15 PM, Houston (Floor 5) <i>Session:</i> Supply Chain Management in Developing Countries 2 <i>Chair(s):</i> Ebrahim Roumi	<i>Track:</i> Supply Chain Management
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025-0003 Environmental requirements in the Brazilian auto industry: a case study in a first tier auto parts manufacture

Rosangela Vanalle, Professor, Universidade Nove De Julho, Brazil
 Wagner Lucato, Professor, Universidade Nove De Julho, Brazil
 Leandro Santos, Student, Universidade Nove De Julho, Brazil

To verify to what extent the eco-friendly requirements have been imposed by auto industry companies to their suppliers, this paper examines the case of a first tier Brazilian auto parts manufacturer. The results could demonstrate that environmental requirements are of key importance in evaluation, selection and maintenance of a supplier.

025-1616 Challenges Inherent in Managing Supply Chains with Components in Developed and Developing Countries

Ebrahim Roumi, Professor, University Of New Brunswick, Canada
 Edith Brideau, Student, Northcentral University, Canada

Globalization has necessitated attention to the disparity between management issues in developed and developing countries. Profound differences in many aspects of managing manufacturing and service processes between first and third world countries exist. In many cases components of a supply chain are spread in both worlds which require addressing challenges.

025-1376 Transaction Cost approach to Cooperatives Companies' Supply Chain: Case Study in a Brazilian Dairy Cooperative

Fernanda Pacheco Dohms, Student, PUCRS Pontificia Universidade Católica do Rio Grande do Sul, Brazil
 Sergio De Gusmão, Professor, PUCRS Pontificia Universidade Católica do Rio Grande do Sul, Brazil

This paper analyzes a cooperative company's supply chain, focusing in the relations between its main partners by the Transaction Cost approach. This analyze was based especially in cooperativism main features and also the company sector, agribusiness. The main results were based in some inefficiencies of this two main analyzed points.

025-0966 Sustainable food supply chain in the Indian context

Saibal Ray, Associate Professor, Mcgill University, Canada
 Sameer Mathur, Assistant Professor, Mcgill University, Canada
 Rajesh Tyagi, Assistant Professor, Hec Montreal, Canada
 Aditya Jain, Assistant Professor, Indian School Of Business, India

The main objective of our research is to better understand the underlying issues in the Indian food value-chain, especially in the context of processing and retailing, using economic modeling and empirical analysis. The study will compare and contrast the supply chain infrastructure and dynamics of Canadian and Indian markets.

263	Sunday, 02:45 PM - 04:15 PM, Watertower (Floor 10) <i>Session:</i> Modeling Travel and Hospitality Services <i>Chair(s):</i> Gregory Heim	<i>Track:</i> OM in Travel, Tourism, and Hospitality Industries
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025-1123 Are Consumers Strategic? Structural Estimation from the Air-Travel Industry

Jun Li, Student, University Of Pennsylvania, United States
 Nelson Granados, Assistant Professor, Pepperdine University, United States
 Serguei Netessine, Emeritus Professor, INSEAD, France

Merging two unique datasets from the air-travel industry, we examine the question whether consumers are strategic and to what degree. We show persistent evidence of strategic consumers across various markets using structural estimation. We further investigate the revenue implications using counter-factual analysis.

025-1748 A Behavioral Perspective of Strategic Interactions in Revenue Management Markets

Srini Krishnamoorthy, Assistant Professor, Richard Ivey School of Business, Canada

Standard game theoretic models fail to explain aggregate pricing decisions of travel capacity providers that often appear to be economically irrational. A typical example is a price war between competing airlines or competing special deals offered by hotels. We use behavioral game theory to obtain more realistic predictions of provider behavior in competitive revenue management markets.

025-1374 Adoption of Supply Chain Security Practices in the Food Industry: An Institutional Perspective

Guanyi Lu, Student, Texas A&M University College Station, United States
 Xenophon Koufteros, Associate Professor, Texas A&M University College Station, United States

The field of supply chain security management has garnered extensive attention by both academics and practitioners as a result of an array of natural and man-made disasters. We adopt the institutional perspective and provide three explanations why firms adopt supply chain security management routines in the food industry.

025-1080 What Features Drive Fractional Service Value? Evidence from Resort Timeshares

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

Although a major class of hospitality/travel experience service, little research has examined timeshares or other fractional ownership services. This paper examines whether timeshare vacation service experiences or options more strongly affect the valuation and ownership of timeshare units.

264	Sunday, 02:45 PM - 04:15 PM, Ballroom F (Floor 5)	<i>Track:</i> Product Innovation and Technology Management
	<i>Session:</i> Innovation Contests	
	<i>Chair(s):</i> Anant Mishra	

025-0944 Do Participation Strategy and Experience Impact the Likelihood of Winning in Unblind Innovation Contests?

Cheryl Druehl, Assistant Professor, George Mason University, United States
 Jesse Bockstedt, Assistant Professor, George Mason University, United States
 Anant Mishra, Assistant Professor, George Mason University, United States

We examine the dynamics of competition in "unblind" innovation contests—an increasingly popular format for innovation contests where solutions submitted by contestants as well as the feedback received on them are viewable by other contestants. Using data from 1024 logo design contests involving more than 45000 submitted entries and 2526 unique contestants, we explore the role of participation strategies and prior experience in the contest environment on the likelihood of winning a contest.

025-1607 Stage-Gate Contracts for NPD Projects

Krishnan Anand, Associate Professor, University Of Utah, United States
 Chunlin Wang, Student, University Of Utah, United States
 Glen Schmidt, Associate Professor, University Of Utah, United States

Consider a principal who outsources product development to an agent. Both the principal's specialized (hidden) information on the project's prospects and the agent's non-contractible efforts are crucial to the project's success. We model and compare the implications of payments tied to each stage versus simply outsourcing the entire project.

025-1683 Competition and Effort in Innovation Contests with Evaluation Uncertainty

Sanjiv Erat, Assistant Professor, Rady School of Business, UCSD, United States
 Raul Chao, Assistant Professor, University Of Virginia, United States

We consider innovation contests in which the principal cannot objectively evaluate the quality of the solutions offered by agents, a term we refer to as "evaluation uncertainty". In a controlled experiment we find evidence that competition leads to higher effort on the part of agents when evaluation uncertainty is high.

025-0806 Patent Battles for Complex Technologies

Juergen Mihm, Assistant Professor, INSEAD, France
 Tan Wang, Student, INSEAD, France
 Fabian Sting, Assistant Professor, Rotterdam School Of Management, Netherlands

We study strategic patenting in complex technology landscapes. Through their R&D activities firms explore technology landscapes. A key decision is which aspects of their search should be patented. Our model explicitly captures the tradeoff that arises from patenting: Patents protect technology configurations but they reveal current R&D focus and outcome.

265	Sunday, 02:45 PM - 04:15 PM, Los Angeles (Floor 5)	<i>Track:</i> Production Planning and Scheduling
	<i>Session:</i> Applications of Production Planning and Scheduling I	
	<i>Chair(s):</i> Seung Jin Ha	

025-0678 Integrated Scheduling of Door Manufacturing Operations at Renault Turkey

Mehmet Taner, Associate Professor, Bilkent University, Turkey
 Osman Alp, Assistant Professor, Bilkent University, Turkey
 Nurcan Bozkaya, Student, Bilkent University, Turkey

An MIP model and a rolling horizon based heuristic are proposed to produce schedules capturing the trade-off between inventory holding and setup costs in manufacturing different vehicles' doors. Eligibility and integration restrictions and properties of unitizing vessels make the problem academically interesting.

025-0946 Development of the Optimized Algorithm for Scheduling the 4-Stroke Diesel Engine in the Engine Assembly Shop

Choi Tae-Hoon, Senior Researcher, Hyundai Heavy Industry Co., Korea, Republic of (South Korea)
 Seung Jin Ha, Principal Researcher, Hyundai Heavy Industry Co., Korea, Republic of (South Korea)
 Ji-On Kim, Principal Researcher, Hyundai Heavy Industry Co., Korea, Republic of (South Korea)
 Dae-Soon Kim, director, Hyundai Heavy Industry Co., Korea, Republic of (South Korea)
 Soon-Ik Hong, Researcher, Hyundai Heavy Industry Co., Korea, Republic of (South Korea)

In this paper, optimized production scheduling algorithm for 4-stroke diesel engine was studied. Heuristic algorithm deciding optimized schedule is proposed for improving efficiency and productivity of engine assembly. The result of algorithm provides solution for the best location of production stage and the best moment of start time for production.

025-0782 A hybrid-PSO approach for production scheduling with parallel machine problem in DRAM module industry

Li Chih Wang, Professor, Tunghai University, Taiwan, Republic of China
 Shu Fen Li, Student, Tunghai University, Taiwan, Republic of China
 Yueh Ching Jai, Student, Tunghai University, Taiwan, Republic of China

This paper proposes a hybrid Particle Swarm Optimization (HPSO) approach, which is combined with variable neighborhood search (VNS) algorithm, to solve a hybrid flow shop scheduling with parallel machine problem. A DRAM module industry case is selected to illustrate the effectiveness of the HPSO model.

025-0948 The two stage assigning and scheduling algorithm for 2-stroke engine assembly shop

Ji-On Kim, Principal Researcher, Hyundai Heavy Industry Co., Korea, Republic of (South Korea)
 Choi Tae-Hoon, Senior Researcher, Hyundai Heavy Industry Co., Korea, Republic of (South Korea)
 Seung Jin Ha, Principal Researcher, Hyundai Heavy Industry Co., Korea, Republic of (South Korea)
 Soon-Ik Hong, Researcher, Hyundai Heavy Industry Co., Korea, Republic of (South Korea)

Two stage scheduling algorithms are proposed. The first stage, engines are assigned and scheduled to assembly shops on the due date by the initial algorithm. The second stage, three algorithms are proposed which improve the balance of workload, the efficiency of stage usage, and the reduction of storage period respectively

266	Sunday, 02:45 PM - 04:15 PM, Northwestern (Floor 6) <i>Session:</i> Behavioral and Empirical Supply Management <i>Chair(s):</i> Thomas Kull	<i>Track:</i> Supply Management
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025-1752 Manufacturer-supplier joint innovation under technical and relational uncertainty: a cultural perspective

Tingting Yan, Assistant Professor, Wayne State University, United States
 Tom Kull, Assistant Professor, Arizona State University Tempe, United States

This study examines how technical and relational uncertainty will influence a manufacturer's strategy in involving suppliers in new product development. Specifically, we examine how cultural differences between China and United States moderate the impacts of uncertainty on different involvement strategies. The model is tested using data from China and U.S.

025-0801 Reflections on Buyer-Supplier Relationships: A Meta Analysis

ManMohan Sodhi, Professor, Cass Business School, United Kingdom
 Canan Kocabasoglu Hillmer, Senior Lecturer, Cass Business School, United Kingdom

Buyer-supplier relationship research has increased significantly over the last two decades. This has given rise to a better informed but disjointed picture of these relationships. The objective of this study is to reflect on this new knowledge using meta-analysis to identify those areas where exiting new avenues for research exist.

025-1804 Accessing Supplier Technology: Being a Customer of Choice Matters

Scott Ellis, Assistant Professor, University Of Kentucky, United States
 John Henke, Professor, Oakland University, United States
 Tom Kull, Assistant Professor, Arizona State University Tempe, United States

We develop a social exchange theory model explaining how buyer NPD practices affect how valuable suppliers perceive buyers to be, which in turn influences suppliers' relational behaviors. Results show that access to new technology through NPD-related supply management practices is mediated by a buyer being a preferred customer.

025-1805 Relationship Dynamics and Performance in Collaborative NPD Projects

Moronke Idiagbon-Oke, Associate Professor, Grand Canyon University, United States
 Adegoke Oke, Assistant Professor, Arizona State University Tempe, United States

How do relationship dynamics influence a collaborative NPD project with vertically and horizontally networked firms? Our case study method investigates three such networks of buyers, suppliers, and other firms engaged in developing innovative automotive technology. We give four propositions into how the relationship dynamics between firms affect NPD performance.

267	Sunday, 02:45 PM - 04:15 PM, Ballroom C (Floor 5) <i>Session:</i> Designing and Managing Healthcare Systems and Supply Chains <i>Chair(s):</i> Urban Wemmerlov	<i>Track:</i> Healthcare Operations
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025-0041 Innovating to increase the connectedness of hospitals' internal supply chains

Scott Heisler, Innovation Specialist, Kaiser Permanente, United States
 Laura Janisse, Senior Design and Innovation Analyst, Kaiser Permanente, United States
 Christine Richter, Senior Consultant/ Innovation Advisor, Kaiser Permanente, United States
 Anita Tucker, Associate Professor, Harvard University, United States

Using IDEO's innovation process, we examined the internal supply chain of two hospitals. Our goal was to increase nurses' readiness to provide care to newly admitted patients. We present a framework and key stories that illustrate the design opportunities. We also propose factors that will help increase connectedness among departments.

025-1165 Coordination and decision making by paramedics: Results of a mixed fidelity simulation

Michael Smith, Assistant Professor, Ohio State University, United States
 David Woods, Professor, Ohio State University, United States
 Sharon Schweikhart, Associate Professor, Ohio State University, United States

Using a mixed fidelity simulation of challenging EMS cases, we examine how experienced and novice paramedics adapt to the cognitive and coordination challenges of complex and dynamic work situations. Workflow analyses examine differences in paramedics' decision-making patterns and provide insight in cognitive errors likely to occur in complex situations.

025-1601 Buyer and Supplier Perspectives on Healthcare Value Analysis

Vicki Smith-Daniels, Professor, Indiana University, United States

With value-based reimbursement on the horizon, health care providers and life sciences companies need to develop new value analysis models to consider revenue, cost savings, clinical quality, and patient satisfaction. This presentation presents a theoretical model for healthcare value analysis that benefits both healthcare providers and the life sciences industry.

268	Sunday, 02:45 PM - 04:15 PM, Kansas City (Floor 5) <i>Session:</i> Patient Flow and Access to Care <i>Chair(s):</i> Tingting Jiang	<i>Track:</i> Healthcare Operations
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025-0962 Provider's Wait-Preempt Dilemma

Michele Samorani, Student, University Of Colorado Boulder, United States

Subhamoy Ganguly, Student, University Of Colorado Boulder, United States

An idle provider faces the wait-preempt dilemma when the patient scheduled to be seen next has not shown up yet, but a patient supposed to be seen later has already arrived. We propose analytical models and simulation based methods to resolve the dilemma, whether to preempt or to wait.

025-1769 Modeling the Future of the Canadian Cardiac Surgery Workforce using Systems Dynamics

Michael Carter, Professor, University Of Toronto, Canada
 Chris Feindel, Professor, University Of Toronto, Canada
 Tim Latham, Instructor, University Of British Columbia, Canada
 Sonia Vanderby, Assistant Professor, University Of Saskatchewan, Canada

We present a system dynamics model of the national workforce within a single physician specialty which captures the effects of surgeons' workload and student's enrollment decisions. The model is demonstrated through a case study of the Canadian cardiac surgeon workforce under two extreme scenarios of physician motivation.

025-1437 Pre-processing to improve patient flow, education, and quality of care

Kayode Williams, Assistant Professor, Johns Hopkins School of Medicine, United States
 Chester Chambers, Assistant Professor, Johns Hopkins University, United States

Academic medical centers have many process flows made more complicated by steps added for medical education. This study includes an intervention in which an attending physician moves interaction with residents offline and standardizes those interactions. The results include reduced waiting times, increased throughput, and improved quality of care.

025-0762 Primary Care Physician Capacity Decision and Primary Care Access for Medicaid Patients

Tingting Jiang, Student, Northwestern University, United States

The recent Affordable Care Act temporarily raises Medicaid payment rates for primary care services to alleviate primary care access shortage for Medicaid patients. This paper studies how primary care physicians will respond to the Medicaid expansion in capacity allocation and investment decisions as the competition for primary care resource intensifies.

269	Sunday, 02:45 PM - 04:15 PM, Wisconsin (WI) (Floor 6) <i>Track:</i> Retail Operations
	<i>Session:</i> Retail Supply Chain Management
	<i>Chair(s):</i> Mumin Kurtulus

025-0910 Empirical Test of Consequences of Category Captainship

Alper Nakkas, Instructor, Vanderbilt University, United States
 Jeff Dotson, Assistant Professor, Vanderbilt University, United States
 Mumin Kurtulus, Assistant Professor, Vanderbilt University, United States

Our research explores the consequences of a recent trend known as category captainship where a retailer relies on one of the manufacturers for recommendations regarding category management. Our results are based on a data set for two categories that includes pre and post category captainship assortments.

025-1156 Markdown Optimization for a Fashion e-tailer: The Impact of Returning Customers

Georgia Perakis, Professor, Massachusetts Institute Of Technology, United States
 Pavithra Harsha, Research Staff Member, T. J. Watson Research Center, United States
 Zachary Leung, Student, Massachusetts Institute Of Technology, United States

The existing markdown optimization methods ignore the fact that customers who do not buy in a given period may return to the store in later periods. In our research, we provide empirical evidence that this effect is significant in practice, and quantify the benefit of pricing that considers returning customers.

025-1421 A Distribution Practice for Retail Online Order Fulfillment

Milad Ebtehaj, Student, University Of Massachusetts Amherst, United States
 Agha Ali, Professor, University Of Massachusetts Amherst, United States

We propose a fast-moving distribution channel for the demand fulfillment of online purchased products in a 'buy online, pickup at store' retail sales model. The distribution practice is modeled as a two-stage location routing problem. Computational tests evaluate the benefits of full-SKU versus partial-SKU demand fulfillment strategies.

025-1729 Retailer-driven clothing supply networks

Bart MacCarthy, Professor, University Of Nottingham, United Kingdom
 Amila Jayarathne, Student, University Of Nottingham, United Kingdom

Supply networks in the clothing industry are driven by retailers and major brands. We examine the diversity of supply networks that exist. The analysis includes the level of integration, the relationships between the retailer and prime manufacturer, functional authority for key activities, and planning approaches across different types of network.

270	Sunday, 02:45 PM - 04:15 PM, River North (Floor 2) <i>Track:</i> OM in Latin America and the Caribbean
	<i>Session:</i> Logistics and Supply Chain Management in Latin America
	<i>Chair(s):</i> Martin Tanco

025-1144 Determinants of Reverse Logistics Execution in the Brazilian Supermarket Industry

Janaina Siegler, Student, Fundacao Getulio Vargas, Brazil
 Ronan Quintao, Professor, Centro Federal de Educaçao Tecnol6gica de Minas Gerais, Brazil
 Luciana de Jesus, Student, FUNCESI, Brazil

The paper aims to describe the determinants of reverse logistics execution for post-consumption in the Brazilian supermarket industry. The method involved multiple case study, non-participant observation and semi-structured interviews. A conceptual model was developed mapping the determinants and, then, those most and least used by the sample were identified.

025-1367 Efficiency or responsiveness? The dilemma of sugar cane supply chain

Luiz Carlos Di Serio, Professor, Fundacao Getulio Vargas, Brazil
 André Luis Duarte, Professor, Insper Institute for Education and Research, Brazil
 Marcio Santos, Head of engineering and implementation, Copersucar S/A, Brazil
 Guilherme Martins, Student, Fundacao Getulio Vargas, Brazil

The supply chain management of sugar cane products (i.e. ethanol and sugar) presents an important trade-off. As an agricultural commodity, products have low added-value and efficiency drives chain's operations. Notwithstanding, responsiveness is crucial, since our study demonstrated a high level of uncertainty, both in demand and supplier sides.

025-1634 Supply chain disruption because of power distance in foreign subsidiaries

Omar Salgado, Professor, EGADE Business School, Mexico
 Victor Gonzalez, Finance Director, Volkswagen de Mexico, Mexico

This article reports supply chain disruption cases in a foreign subsidiary caused by a high power distance in Mexican culture that in combination with a unidirectional and determined management style of German expatriates hinders early reports of deviations. Cases are analyzed based on supply chain disruption mitigation and risk literature.

025-0122 Assessment of SME Supply Chain Management Best Practices: A Survey in Uruguay

Daniel Jurburg, Student, Universidad De Montevideo, Uruguay
 Martin Tanco, Associate Professor, Universidad De Montevideo, Uruguay

A survey is presented concerning the adoption of several practices in Supply Chain Management. The survey was carried out within SME manufacturing and retailing companies in Uruguay, yielding 99 valid responses. The survey aims to find which best practices are used within SCOR® components: Plan, Source, Make, Deliver, and Return.

271	Sunday, 02:45 PM - 04:15 PM, Cook (Floor 3) <i>Session:</i> Emerging Risks in Global Supply Chains <i>Chair(s):</i> Meike Schroeder	<i>Track:</i> Supply Chain Risk
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025-0796 Towards a counterfeit-proof global supply chain

Morteza Pourakbar, Student, Rotterdam School Of Management, Netherlands
 Rob Zuidwijk, Professor, Erasmus University Rotterdam, Netherlands

Counterfeiting activities are known as a major harm to legitimate supply chains. In this study, we investigate the role of customs authorities and rights-owners in the fight against counterfeiting. In a game setting, we analyze how customs and rights-owner alliance results in lower level counterfeiting risks.

025-0993 Competition and loss of exclusivity in tobacco contract farming in Brazil

Hildo Souza Filho, Associate Professor, Universidade Federal De São Carlos, Brazil
 Antonio Buainain, Professor, Universidade Estadual de Campinas, Brazil

Loss of exclusivity in tobacco leaves contract farming in Brazil was analyzed. Transaction Cost Economics was used. A sample of 381 growers provided data to measure exclusivity by means of mathematical Euclidean distance. Strategies adopted by tobacco processors introduced uncertainty, higher costs and unknown consequences to the traditional hybrid governance.

025-1001 Protection of Intellectual Properties in Outsourcing Relationships: A Review & Emerging Research Issues

Dennis Jamrose, Student, Suny At Buffalo, United States
 Nallan Suresh, Professor, Suny At Buffalo, United States

Outsourcing has become one of the key strategies available for firms in recent years, to lower costs, increase transactional efficiency, access new markets and new technologies. Like other strategic moves, it must be employed judiciously, in appropriate settings, for appropriate reasons, cognizant of the various risks involved, including potential loss of intellectual property rights. Supplier selection for outsourcing should extend beyond traditional, cost-related concerns, and must also include costs and risks pertaining to preservation of intellectual property. However, past research on supplier selection and supplier relationships has not adequately addressed the issues of protection of intellectual properties. In this paper, we conduct a systematic literature review, apply theories on intellectual properties drawn from research on strategic alliances and JVs to the framework of supplier selection and relationships. A hypothesized model structure is presented for empirical investigation, based on related theory, and research issues in this emerging area are proposed.

025-1021 Securing the Supply Chain: A Theoretical Analysis of Supply Chain Theft

Christopher Swanton, Student, University Of Minnesota, United States
 Kevin Linderman, Associate Professor, University Of Minnesota, United States
 Johnny Rungtusanatham, Professor, Ohio State University, United States

Supply chain theft costs companies billions of dollars annually. Routine Activity Theory (RAT) offers a theoretical lens to investigate supply chain theft. Using data from Fortune 500 companies, we test the tenets of Routine Activity Theory (RAT) and further explore its least studied aspect - capable guardianship.

025-1230 Compilation of Measures and Strategies to Manage Transport Risks -Empirical Results from the Baltic Sea Region

Meike Schroeder, Student, Institute of Business Logistics and General Management, Germany
 Henning Skirde, Student, Institute of Business Logistics and General Management, Germany
 Max Feser, Student, Institute of Business Logistics and General Management, Germany
 Carolin Singer, Student, Institute of Business Logistics and General Management, Germany

The results of the EU project Connecting Authorities for Safer Heavy Goods Traffic in the Baltic Sea Region (BSR) will be presented. By conducting a survey and expert interviews transport risks in the BSR have been identified and classified. Additionally measures and strategies to manage transport risks have been compiled.

272	Sunday, 02:45 PM - 04:15 PM, Ballroom G (Floor 5) <i>Session:</i> Service Design with Co-Production <i>Chair(s):</i> Guillaume Roels	<i>Track:</i> Service Operations
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025-0239 The Design Challenges of Experiential Services

Stylianos Kavadias, Associate Professor, Georgia Institute Of Technology, United States
Ioannis Bellos, Student, Georgia Institute Of Technology, United States

Building on the customer journey concept, which maps an experiential service to customer-provider interaction touchpoints, we analyze the service provider's design decisions: the touchpoints she controls, and the price she charges. We fully characterize the conditions under which the provider can use her design decisions to successfully signal service quality.

025-0413 The Economics of Joint Production in Services

Guillaume Roels, Assistant Professor, University Of California Los Angeles, United States

In this talk we study the economics of joint production in services. We formalize the notions of complementarity, boundary between the provider and the client, and returns to scale. Our study generates insights on service design.

025-0705 Managing Retention in Service Relationships

Ioana Popescu, Associate Professor, INSEAD, Singapore
Sam Aflaki, Assistant Professor, Hec Montreal, France

Consider a firm that can actively customize the service offered to customers in a repeat business context. We propose a dynamic model of the firm-client relationship that relies on behavioral theories and empirical evidence to model the evolution of service quality expectations and their impact on customer retention and profitability.

025-0017 Learning in Collaborative Service Processes

Guillaume Roels, Assistant Professor, University Of California Los Angeles, United States
Uday Karmarkar, Professor, UCLA, United States
Morvarid Rahmani, Student, UCLA, United States

We study the dynamics of collaboration when the parties are uncertain about the effectiveness of their teamwork. We assume that the team's success probability is uncertain and has to be learned. We find that the parties may choose to collaborate early on to discover the effectiveness of their teamwork.

273	Sunday, 02:45 PM - 04:15 PM, Miami (Floor 5)	<i>Track:</i> Capacity Management
	<i>Session:</i> Capacity in the Energy and Publishing Industries	
	<i>Chair(s):</i> Rodney Parker	

025-0537 Competitive environment, operations strategy, and performance: An empirical study of Canadian Oil and Gas Serv

Joshua Raddis, Student, Mount Royal University, Canada
Kalinga Jagoda, Associate Professor, Mount Royal University, Canada

Current literature on the adoption and implementation of operational strategies within the oil and gas services industry has been limited. Using a large sample from the Canadian oil and gas industry, this paper examines the influence of organizational factors on the relationship between operations strategy processes and operations performance.

025-0375 Strategic Analysis of Technology and Capacity Investments in the Liquefied Natural Gas Industry

Erkut Sonmez, Assistant Professor, Boston College, United States
Sunder Kekre, Professor, Carnegie Mellon University, United States
Alan Scheller-Wolf, Professor, Carnegie Mellon University, United States
Nicola Secomandi, Associate Professor, Carnegie Mellon University, United States

Motivated by recent developments in LNG industry, we investigate issues related to strategic technology selection, as well as choices around technology configuration and capacity for the incumbent and emerging technologies. The resulting analysis provides principles delineating the impact of alternative LNG throughput models on strategic technology, configuration and capacity choices.

025-0666 Operation and Investment of Storage in an Electrical System

Roman Kapuscinski, Professor, University Of Michigan Ann Arbor, United States
Owen Wu, Assistant Professor, University Of Michigan Ann Arbor, United States
Santhosh Suresh, Student, Ross School of Business, United States

Storage is becoming increasingly prevalent in the electric grid. We discuss optimal siting and sizing of storage in the grid. The objective is to minimize overall operating costs accounting for transmission and storage losses. We show the degree of storage pooling to be related structurally to several system parameters.

025-0213 Competing for Shelf Space under a Buyback Contract

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

We investigate how competition between upstream suppliers for limited retailer shelf-space affects terms in buyback and wholesale-price contracts. We observe competition can endow the retailer with rents beyond those offered with a monopolist supplier. We further compare the effects of competition upon each contract, observing the effects on channel efficiency.

275	Sunday, 02:45 PM - 04:15 PM, Indiana (Floor 6)	<i>Track:</i> Vendor and Supply Contracts
	<i>Session:</i> Information Issues in Supply Chains	
	<i>Chair(s):</i> Gregory DeCroix	

025-0591 With or Without Forecast Sharing: Competition and Credibility under Information Asymmetry

Mehmet Gumus, Assistant Professor, Mcgill University, Canada

Forecast sharing among trading partners lies at the heart of many collaborative SCM efforts. That said, there is concern in the same circles that forecast-sharing may induce collusive behaviour. In this paper, we develop a supply chain model in order to explore whether such a concern is grounded.

025-0522 The Impact of Information Type on Capacities and Profits in a Multi-Product Assemble-to-Order System

Fernando Bernstein, Professor, Duke University Durham, United States

Gregory DeCroix, Associate Professor, University Of Wisconsin Madison, United States

Prior to choosing component capacities, a firm selling two products can obtain information about either total demand across the products or the mix of demands between the products. We examine the impact of each type of information on capacity choices and firm profits.

025-1341 Public forecast information sharing under the threat of an entry of a competing supply chain

Noam Shamir, Northwestern University, United States

Hyoduk Shin, Assistant Professor, Northwestern University, United States

We study a retailer's forecast information sharing within a supply chain as well as between competing supply chains. We show that the threat of an entry can provide credibility for truthful information sharing of a retailer, and that the competition can increase the profits of firms within a supply chain.

025-0157 Supply chain coordination under yield and demand uncertainty

Yong He, Associate Professor, Southeast University, China

A typical supply chain operates under both yield and demand uncertainty. The main purpose of this paper is to study the inventory, production, and contracting decisions of a supply chain with both yield and demand uncertainty. An optimal contract that achieves the best performance of the supply chain is provided.

276	Sunday, 04:30 PM - 06:00 PM, Scottsdale (Floor 5)	<i>Track:</i> Behavioral Operations
	<i>Session:</i> Teamwork Behavior in OM	
	<i>Chair(s):</i> Chen Yen-Tsang	

025-0424 Team Dynamics and Decision Making Under Uncertainty: Insights from the Canadian Oil and Gas Industry

Graeme Simari, Student, Mount Royal University, Canada
Kalinga Jagoda, Associate Professor, Mount Royal University, Canada

Renewed interest in the Canadian Oil Sands operations coupled with economic downturn has yielded new complexities. Managing these complexities are paramount for their survival. Using three case studies from the Canadian Oil & Gas industry, this paper investigates how team dynamics influence operations decisions in an uncertain and complex environment.

025-0690 Challenging One of the Most Detrimental Effects in Project Management: The Harmful Multitask

Chen Yen-Tsang, Student, Fundacao Getulio Vargas, Brazil
João Mario Csillag, Professor, Fundacao Getulio Vargas, Brazil
Ronaldo Dultra-de-Lima, Student, Fundacao Getulio Vargas, Brazil
João Luis Quaglia, Student, Fundacao Getulio Vargas, Brazil
Daniel Galelli, Student, Fundacao Getulio Vargas, Brazil

Projects are means through which organizations implement their strategies. Despite relying on the support of countless management tools, project managers are still challenged with high failure rates. This study, through experiments, demonstrated the harmful effect of the multitask at the resource allocation and proposed how to switch this effect off.

025-1074 Beyond the baton: teamwork, learning and organizational culture in orchestras

Rita Fucci-Amato, Student, University of Sao Paulo, Engineering School of Sao Carlos, Brazil
Fernando Almada Santos, Assistant Professor, Universidade De Sao Paulo, Brazil
João Amato Neto, Professor, Polytechnic School Of Sao Paulo, Brazil

The purpose of this paper is the development of a conceptual framework for the analysis of orchestras' management, covering the themes: a) teamwork, leadership and organizational culture; b) organizational learning and knowledge management; c) sociological characters of orchestras' organization and of players' and maestros' work and formation.

025-1079 Managing & conducting: maestros on the management of choral organizations

Rita Fucci-Amato, Student, University of Sao Paulo, Engineering School of Sao Carlos, Brazil
Edmundo Escrivão-Filho, Associate Professor, University of Sao Paulo, Engineering School of Sao Carlos, Brazil
João Amato Neto, Professor, Polytechnic School Of Sao Paulo, Brazil

Based on the description of the managerial competence of maestros, the paper analyses data collected with 142 choral singers and 8 (eight) conductors of 10 (ten) countries of America and Europe (Argentina, Canada, England, Italy, Mexico, Netherlands, Peru, Portugal, Switzerland, and USA).

025-1580 The worker competences in agricultural units related to research.

João Camarotto, Professor, Universidade Federal De São Carlos, Brazil
Maria Luz, Student, Universidade Estadual de Maringá, Brazil

This paper includes a literature study through the understanding of the relationship between worker competences and work in agricultural units and institutes of education and research in Brazil. It is understood by agricultural units, also called the experimental farms, which are aimed at teaching, research and extension activities.

277	Sunday, 04:30 PM - 06:00 PM, Lincolnshire II (Floor 6)	<i>Track:</i> Empirical Research in OM
	<i>Session:</i> Using Quasi-experiments/Experiments in Empirical Research	
	<i>Chair(s):</i> William Schmidt	

025-0695 When Does Adoption of the ISO 9001 Quality Standard Improve Quality Outcomes?

Michael Toffel, Associate Professor, Harvard University, United States
William Schmidt, Student, Harvard University, United States

We hypothesize several circumstances under which adopting the ISO 9001 quality management standard should facilitate improvements in quality outcomes. We test our theory using a difference-in-differences approach based on a coarsened exact matched sample, which enables us to draw causal inferences that link quality outcomes to ISO 9001 adoption.

025-0719 The Usefulness of Experiments

Enno Siemsen, Assistant Professor, University Of Minnesota, United States

Experimental methods have become more popular in operations management research. We highlight control, efficiency and responsiveness as the main benefits of this methodology, and discuss the rise and future of experimental research in the field of operations management.

025-0936 Does Inventory Turnover Predict Future Stock Returns?

Vishal Gaur, Associate Professor, Cornell University, United States
Yasin Alan, Student, Cornell University, United States
George Gao, Assistant Professor, Cornell University, United States

We examine the impact of inventory turnover performance of publicly listed U.S. retailers on their stock returns using the traditional approach in the asset pricing literature with annual test portfolios. We find that high inventory productivity is a strong predictor of future stock returns, and investigate potential reasons.

278	Sunday, 04:30 PM - 06:00 PM, Ohio State (Floor 6)	<i>Track:</i> Humanitarian Operations and Crisis Management
	<i>Session:</i> Relief Supply Chains	
	<i>Chair(s):</i> Shantanu Bhattacharya	

025-0760 Humanitarian SCs -A framework to identify and classify research areas and needs

Nezih Altay, Associate Professor, Depaul University, United States
Arunchalam Narayanan, Assistant Professor, Texas A&M University College Station, United States

Most research in humanitarian area deals with disaster relief, where the complexity is higher and needs are immediate. There is another group of SCs that involves humanitarian development, which could be both local and global. We describe the unique characteristics, and identify the research needs of this SCs.

025-1447 Last mile visibility in a humanitarian supply chain

Ira Haavisto, Student, Hanken School of Economics, Finland

The aim of this study is to analyze whether the outcome of humanitarian logistics processes is equivalent to the expected logistics performance. Work-flow charts and manuals were analyzed and in-depth interviews conducted with one humanitarian organization. The study shows that logistics processes do not include last mile supply chain activities.

025-0970 Designing Efficient Resource Procurement and Allocation Mechanisms

Shantanu Bhattacharya, Associate Professor, INSEAD, Singapore
Sameer Hasija, Assistant Professor, INSEAD, Singapore
Luk Van Wassenhove, Professor, INSEAD, France

We analyze the efficiency of different resource procurement and allocation mechanisms in the design of humanitarian logistics-based supply chains. We find that outcomes with a centralized procurement system but decentralized infrastructural investments are the same as with a completely centralized system (where both procurement and infrastructural investments are centralized).

279	Sunday, 04:30 PM - 06:00 PM, Purdue (Floor 6) <i>Track:</i> OM in China/East Asia
	<i>Session:</i> Service Operations and Innovation Research in China
	<i>Chair(s):</i> Guohua Wan Cuicui Meng

025-0593 Consumer Adoption of Tourism Electronic Commerce: A Framework for Empirical Research Based on Structural Equation

Xianhao Xu, Professor, Huazhong University Of Science & Technology, China
Hongxia Peng, Student, Huazhong University Of Science & Technology, China
Wen Chen, Student, Huazhong University Of Science & Technology, China

Tourism electronic commerce has a great market potential in China. We review the literature and propose a framework for empirical research based on structural equation modeling which focuses on the study of consumers' behavior during the adoption of tourism electronic commerce.

025-1810 A Robust Optimization Model for Flexible Capacity Investment and Management under Supply Disruption

Cuicui Meng, Student, Shanghai Jiao Tong University, China
Jian Ji, Professor, Shanghai Jiao Tong University, China

Robust Optimization is used to analyze flexible capacity investment and management problem under supply disruption. Through a two-level make-to-order supply chain setting, we formulate the problem as a two-stage robust optimization program, characterize the optimal flexible capacity investment and management policy, and analyze the effect of cost and demand parameters.

280	Sunday, 04:30 PM - 06:00 PM, Great America II (Floor 6) <i>Track:</i> OM Practice
	<i>Session:</i> Sustainable and Humanitarian Operations
	<i>Chair(s):</i> Michael Galbreth

025-0456 Enablers and Barriers for Producer Responsibility

Luk Van Wassenhove, Professor, INSEAD, France
Maria Besiou, Assistant Professor, Kuehne Logistics University, Germany

This case-based research focuses on how the producer responsibility, adopted in different regulatory measures all around the world, is implemented in four industrial sectors: electrical and electronic equipment, photovoltaic, automotive and construction sectors. Barriers preventing its implementation and enablers that will facilitate it are identified.

025-0352 Environmentally Sustainable Supply Chain Model for Cellulosic Ethanol from Woody Biomass

Gregory Graman, Associate Professor, Michigan Technological University, United States

The feedstock supply chain for processing timber used in woody biomass-based ethanol has traditionally followed a forward supply chain structure. This research proposes an alternative view of the feedstock supply chain in which a closed-loop supply chain framework is developed to assess the environmental sustainability of the process.

025-0872 OEM Remanufacturing

James Abbey, Student, Penn State University University Park, United States
Luk Van Wassenhove, Professor, INSEAD, France
Daniel Guide, Professor, Penn State University University Park, United States

We present an overview of current OEM remanufacturing state-of-the-art based on an industry roundtable and projects at a number of OEMs that remanufacture. We find that there are a number of unresolved issues despite the fact that many were reported in the research literature over 15 years ago. There are decisions made in a number of areas including business strategy, product design and procurement strategy that have a significant impact on both the forward and reverse supply chains. If the right decisions are made then remanufacturing becomes a valuable competitive advantage for the OEM. An OEM can create consistency in policies and in decisions to support multiple lifecycles, but few companies understand how to value these benefits. We focus on these issues for an OEM with B2B products, but also discuss implications for B2C OEMs.

025-1811 Transportation and Vehicle Fleet Management in Humanitarian Logistics

Luk Van Wassenhove, Professor, INSEAD, France
Alfonso Pedraza-Martinez, Assistant Professor, Indiana University Bloomington, United States

Vehicle fleet management in humanitarian logistics has characteristics unexplored by researchers. We provide evidence-based insights on logistics challenges imposed by the dual objective of relief and development, decentralization, earmarked funding, and operating conditions. We propose avenues for future research to address strategic, tactical, and operational challenges in humanitarian fleet management.

281	Sunday, 04:30 PM - 06:00 PM, Dupage (Floor 3) <i>Session:</i> Logistics I <i>Chair(s):</i> Rene De Koster	<i>Track:</i> Scheduling and Logistics
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- 025-0228** A two-stage security-check system at border-crossing stations
 Zhe George Zhang, Professor, Western Washington University, United States
 Chia-Hung Wang, Instructor, National Chiao Tung University, Taiwan, Republic of China
 Hsing Luh, Professor, National Chengchi University, Taiwan, Republic of China

A selective security inspection system has been modeled as a two-stage queueing process. In such a system, every customer has to be inspected by the first stage inspector but only a proportion of customers need to go through the second stage for further inspection.

- 025-0558** Design Insights for Container Terminal Operations
 Debjit Roy, Assistant Professor, Erasmus University Rotterdam, Netherlands
 Rene De Koster, Professor, Erasmus University Rotterdam, Netherlands

The design process of container terminal operations is complex due to stochastic interactions among the resources: quay cranes, vehicles, and stacking cranes. Using a stylized queueing network model, we model the interactions among the resources, and study the effect of design parameters on system performance.

- 025-0888** Robust Assignment in a Compact Cross-dock System
 Yugang Yu, Assistant Professor, Rotterdam School Of Management, Netherlands
 Rene De Koster, Professor, Erasmus University Rotterdam, Netherlands
 Nima Zaerpour, Student, Rotterdam School Of Management, Netherlands

We study concurrent dock door and storage assignment in a compact cross-dock system where compact storage systems are used in order to decrease investment and operational costs. We propose an MIP formulation for the problem. An efficient and effective heuristic is proposed which is robust against disturbances in truck schedule.

- 025-1090** Routing Vehicles to Plow Snow-Covered Roads
 Bruce Golden, Professor, University Of Maryland, United States
 Edward Wasil, Professor, American University, United States
 Benjamin Dussault, Student, University Of Maryland, United States

In snow-plowing operations, we consider a variant of the Windy Postman Problem that incorporates multiple vehicles. Our objective is to minimize the length of the maximum route, which involves both reducing and balancing route length. We provide a heuristic that generates very good solutions with respect to a lower bound.

- 025-1696** Plug-In Vehicles Recharging and Vehicle Energy to Grid Optimization
 Navid Sabbaghi, Assistant Professor, Illinois Institute Of Technology, United States
 Alireza Khaligh, Assistant Professor, University Of Maryland, United States
 Zhihao Li, Student, Illinois Institute of Technology, United States

This paper optimizes plug-in vehicles recharging and energy-to-grid service with dynamic programming by monitoring battery state-of-charge and regulating battery current. Deterministic commuting drive-cycle is assumed, while grid load and electricity price originate from grid operator. Study objective is to establish win-win operational mechanism between plug-in vehicles and grid.

282	Sunday, 04:30 PM - 06:00 PM, Ballroom A (Floor 5) <i>Session:</i> Remanufacturing, and Carbon Emissions <i>Chair(s):</i> Atalay Atasu	<i>Track:</i> Sustainable Operations
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- 025-0200** Collective Extended Producer Responsibility Legislation: Implementation and Design Implications
 Atalay Atasu, Assistant Professor, Georgia Institute Of Technology, United States
 Beril Toktay, Professor, Georgia Institute Of Technology, United States
 Ozlem Ergun, Associate Professor, Georgia Institute Of Technology, United States
 Luyi Gui, Student, Georgia Institute Of Technology, United States

Extended Producer Responsibility (EPR) is a policy tool that holds producers financially responsible for the post-use processing of their products. We study efficient and fair implementation of collective EPR by designing fair and transparent cost allocations. We also analyze the implications of collective EPR in terms of providing design incentives.

- 025-0492** Competitive Quality Choice and Remanufacturing
 Ali Parlakturk, Assistant Professor, University Of North Carolina Chapel Hill, United States
 Eda Kemahlioglu-Ziya, Assistant Professor, University Of North Carolina Chapel Hill, United States
 Adem Orsdemir, Student, University Of North Carolina Chapel Hill, United States

We consider an Original Equipment Manufacturer (OEM) competing with an Independent Remanufacturer (IR). OEM decides new product quality, and then OEM and IR compete in quantities. IR's entry threat and entry can decrease consumer surplus. We show either a sufficiently weak or sufficiently strong IR can reduce environmental impact.

- 025-1501** Carbon Tariffs: Impacts on Technology Choice, Regional Competitiveness, and Global Emissions
 David Drake, Assistant Professor, Harvard Business School, United States

This paper analyzes how carbon tariffs affect technology choice, regional competitiveness, and global emissions through a model of imperfect competition between "domestic" (i.e., carbon-regulated) firms and "foreign" (i.e., unregulated) firms, where domestic firms have the option to offshore production and the number of foreign entrants is endogenous.

283	Sunday, 04:30 PM - 06:00 PM, Denver (Floor 5) <i>Session:</i> Eco-Efficiency and Environmental Issues in Emerging Economies <i>Chair(s):</i> Thomas Sloan	<i>Track:</i> Sustainable Operations
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025-1016 Eco-efficiency Measurement in Manufacturing Systems
 Olga Willner, Student, Swiss Federal Institute Of Technology Zurich, Switzerland
 Katharina Bunse, Lecturer, Swiss Federal Institute Of Technology Zurich, Switzerland

The global threat of climate change as well as the quest for energy security reinforces the necessity for a KPI system capable of measuring and evaluating eco-efficiency in a manufacturing environment. This paper discusses the general requirements of such a system and develops a modular and hierarchical KPI structure.

025-1492 The environmental impact on the agricultural pricing: A study in soybean supply chain in southeastern Brazil
 João Amato Neto, Professor, Polytechnic School Of Sao Paulo, Brazil
 Luciano Mazza, Assistant Professor, Production Engineering Department, Brazil

This paper will develop a price formation study on the Brazilian soybean supply chain, considering the environmental impact as an additional cost, in both aspects (tangible and intangible ones). The hypotheses to be confirmed is: Is there difference in market price between the soybeans grown according to sustainability criteria.

025-1477 A Multi-criteria Approach to Balance Economic, Environmental, and Safety Factors in Cleaning Solvent Choices
 Joseph Sarkis, Professor, Clark University, United States
 Thomas Sloan, Associate Professor, University Of Massachusetts Lowell, United States

Many businesses struggle to balance financial, environmental, and safety performance. UMass Lowell's Toxics Use Reduction Institute has evaluated numerous cleaning solvents with respect to these criteria, with the aim of promoting greener, safer alternatives. We develop a multi-criteria optimization model using the CleanerSolutions database to analyze trade-offs.

284	Sunday, 04:30 PM - 06:00 PM, Ballroom H (Floor 5) <i>Session:</i> Web/Blog/Experiential Learning <i>Chair(s):</i> Paul Schikora	<i>Track:</i> Teaching in OM
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025-0036 Exploiting Web Resources for Maximum Teaching and Learning Impact with Integrative Competitive Simulations
 Randall Chapman, President, LINKS Simulations, United States

How can an instructor teach effectively and efficiently with an integrative, large-scale, team-based, competitive supply chain management simulation? By exploiting the simulation's web-based teaching and learning resources! This presentation explores web-based resources for supporting instructors and their students throughout LINKS supply chain management simulation events.

025-0496 Integrating Experiential Learning in the OSCM Core
 Daniel Heiser, Associate Professor, Depaul University, United States
 Paul Schikora, Professor, Indiana State University, United States

Most OM educators agree that providing students significant real-world activities with external clients enhances the value of the student's education. We present a new approach used to provide students with semester long projects outside the university that lead to green belt six-sigma certification at a mid-sized public institution.

025-1707 Using Class Blogs to Extend the Classroom Experience
 Lori Cook, Associate Professor, Depaul University, United States

This session will describe the detailed use of class blogs in a variety of course settings to increase the interaction among students and enhance the student learning process. The session will include insights regarding the creation and execution of the of class blogs.

285	Sunday, 04:30 PM - 06:00 PM, Illinois (IL) (Floor 6) <i>Session:</i> Cellular & Assembly Manufacturing <i>Chair(s):</i> Seyed vahid Daei Niaki	<i>Track:</i> Manufacturing Operations
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025-0502 A mathematical model for dynamic cellular manufacturing systems with production planning and labour assignment
 Seyed vahid Daei Niaki, Student, Islamic Azad University, Qazvin Branch, Iran (Islamic Republic of)
 Esmaeil Mehdizadeh, Assistant Professor, Islamic Azad University, Qazvin Branch, Iran (Islamic Republic of)
 Reza Tavakkoli-Moghaddam, Professor, University Of Tehran, Iran (Islamic Republic of)

This paper presents a comprehensive multi-objective mixed integer mathematical programming model which considers cell formation problem and production planning seamlessly. In addition it follows workers optimum assignment to manufacturing cells. To verify model validation, computational results are presented by solving some numerical examples, using Lingo optimization software in small sized.

025-1271 Capacitated cellular manufacturing system design: A genetic algorithm approach
 Gursel Suer, Professor, Ohio University, United States
 Gokhan Egilmez, Student, Ohio University, United States

In this study, a genetic algorithm (GA) is proposed to solve the cellular manufacturing system design problem. Suer et al.'s (2010) mathematical model and proposed GA are compared. GA found optimal solution in small problems and near-optimal solution in moderate to big sized problems and reduced the solution times significantly.

025-1114 Benefits and problems associated with the operation of a modular assembly line

Mihail Marinov, Student, Yokohama National University, Japan
 Daniel Heller, Associate Professor, Yokohama National University, Japan
 Daniel Whitney, Retired, Massachusetts Institute Of Technology, United States

This paper presents a case study of a modular assembly line operated by an international auto parts supplier. The effect of that line on lead time, cost and quality was investigated. The line consists of production equipment modules that can be easily connected or disconnected to adjust capacity.

286	Sunday, 04:30 PM - 06:00 PM, Ballroom B (Floor 5)	<i>Track:</i> Supply Chain Management
	<i>Session:</i> Channel Management	
	<i>Chair(s):</i> Michael Pavlin	

025-0478 When Gray Markets Have Silver Linings: All-unit Discounts, Gray Markets and Channel Management

Michael Pavlin, Student, University Of Toronto, Canada
 Ming Hu, Assistant Professor, University Of Toronto, Canada
 Mengze Shi, Associate Professor, University Of Toronto, Canada

We study unauthorized distribution channels (gray markets) caused by a reseller's response to a supplier's all-unit quantity discount. We perform a closed-form analysis of the reseller's optimal pricing, inventory and gray market diversion decisions. We identify conditions where it is optimal for the profit-maximizing supplier to accommodate the gray market.

025-1551 Inter-firm system governance: the impact of trust and ease of use on post-adoption usage

Hongchang Wang, Student, Sun Yat-Sen University, China
 Kang Xie, Professor, Sun Yat-Sen University, China
 Jinghua Xiao, Professor, Sun Yat-Sen University, China

We investigated how trust influences post-adoption system usage with an analytical model. In general, we found the impact of trust is direct only in its effective interval, which is determined by ease of use. Before motivating point, trust doesn't influence system usage. After hygiene point, improving trust can't improve usage.

025-0540 Group Incentives in Coordinating Assembly Supply Chains with Non-testable Components

Izak Duenyas, Professor, University Of Michigan Ann Arbor, United States
 Seyed Iravani, Professor, Northwestern University, United States
 Linlin Li, Student, Northwestern University, United States

We consider a supply chain where multiple suppliers contribute to the assembly of a product. The product fails if any of its components fails, but to find the faulty component can be prohibitively difficult. We study group warranty contract to induce suppliers to invest in quality improvement.

025-0370 Collaborative Practices in the Management Automotive Chain: Does the Origin of Automakers Matter?

Osmar Souza Filho, Student, Federal University of Minas Gerais, Brazil
 Susana Pereira, Professor, Fundacao Getulio Vargas, Brazil
 Luiz Carlos Di Serio, Professor, Fundacao Getulio Vargas, Brazil
 Ricardo Martins, Professor, Federal University of Minas Gerais, Brazil

This study analyzed management models used in the Brazilian automotive chain, and was based on the collaborative relationship practices between the tiers. In comparison to the assembly plants from the USA, those from Europe have stronger links with their suppliers and their supply chains are more aligned.

025-1057 A conceptual framework for collaborative forecasting in the UK Food Supply Chain

Can Eksoz, Student, Brunel Business School, United Kingdom
 Afshin Mansouri, Lecturer, Brunel University, United Kingdom

This article presents a conceptual framework to investigate the impact of inadequate large-scale collaboration and non-transparent forecast accuracy on collaborative forecasting in the UK food supply chain. A preliminary framework is developed through systematic literature review. Semi-structured interviews with supply chain practitioners are conducted to enhance validity of the framework.

287	Sunday, 04:30 PM - 06:00 PM, Houston (Floor 5)	<i>Track:</i> Supply Chain Management
	<i>Session:</i> Tactical Supply Chain Decisions 1	
	<i>Chair(s):</i> Nihan Kabadayi	

025-0759 Collaborative buyer-supplier relationships as a source of value creation

Fabio Tescari, Student, Fundacao Getulio Vargas, Brazil

OM literature is scarce in discussing how value is created in a relationship, what is a key issue for creating competitive advantage. This paper aims to develop a value creation framework in a buyer-supplier relationship context, considering relational characteristics and some moderating effects of environmental factors.

025-1360 The role of trust in appropriation of value created in buyer-supplier relationship

Guilherme Martins, Student, Fundacao Getulio Vargas, Brazil
 Luiz Brito, Professor, Fundacao Getulio Vargas, Brazil
 Priscila Miguel, Student, Eaesp - Fgv, Brazil

This paper proposes a conceptual model suggesting a trust optimum in buyer-supplier relationships. While trust is widely discussed as contributing to value creation, its effect on limiting value appropriation is usually neglected in the literature. This can be an alternative or complementary explanation to mixed findings in empirical research.

025-0998 Comparison of periodic-review inventory control policies in a serial supply chain

Nihan Kabadayi, Student, Istanbul University, Turkey
 Timur Keskinurk, Student, Istanbul University, Turkey

This study aims to compare (R, S) and (R, S, Qmin) inventory control policies in a serial supply chain. We develop a simulation based genetic algorithm in order to find the optimal numerical "S" value that minimizes the total supply chain cost (TSCC) and compare our results between two methods.

025-0752 Optimal Replenishment Policy for Time-Varying Deterministic Demand

Kannan Govindan, Associate Professor, University Of Southern Denmark, Denmark
 Devika Kannan, Student, University Of Southern Denmark, Denmark
 Maria Grigore, Manager, -, Switzerland

This paper focuses on evaluating the potential performance of the Silver-Meal heuristic replenishment policy, in a centralized organization, under a traditional supply chain and a Vendor managed inventory (VMI) partnership. The model considered here evaluates the stable or mature products for which the demand is stable over time.

288	Sunday, 04:30 PM - 06:00 PM, Watertower (Floor 10) <i>Track:</i> OM in Travel, Tourism, and Hospitality Industries <i>Session:</i> Overview of Resources from The Cornell Center for Hospitality Research for Teaching and Research <i>Chair(s):</i> Rohit Verma
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025-1142 Overview of Resources from the Cornell Center for Hospitality Research for Teaching and Research

Rohit Verma, Professor, Cornell University, United States
 Mike Dixon, Assistant Professor, Naval Postgraduate School, United States
 María Del Val Segarra Oña, , Cornell Center for Hospitality Research, United States
 Liana Victorino, Assistant Professor, University Of Victoria, Canada
 Jie Zhang, Assistant Professor, University Of Vermont, United States
 Spring Han, Lecturer, Center for Hospitality Research, United States

This session will provide an overview of resources (industry reports, interactive tools, blogs, podcasts, webcasts, etc) available from the Cornell Center for Hospitality Research (CHR) for use in research and teaching. CHR's facilitates collaboration between practitioners and academia by conducting joint research and by organizing conferences and other events.

289	Sunday, 04:30 PM - 06:00 PM, Ballroom F (Floor 5) <i>Track:</i> Product Innovation and Technology Management <i>Session:</i> Coordination in Product and Service Development Projects <i>Chair(s):</i> Jeremy Kovach
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025-0639 Social networks and cooperation: A bibliometric study

Ana Paula Lopes, Student, University Of São Paulo, Brazil
 Marly Carvalho, Associate Professor, Polytechnic School Of Sao Paulo, Brazil

The literature of social networks has changed over time. Some theoretical pillars that justify this increased interest are grounded in the concept of transaction costs and capital. The main objective of this research is to analyze the social network theory. The research method used was the bibliometric study with content.

025-1395 Stakeholder Commitment: Product Development With Uncertainty

Stylianos Kavadias, Associate Professor, Georgia Institute Of Technology, United States
 Jeremy Kovach, Student, Georgia Institute Of Technology, United States

In this paper we investigate how inherent project uncertainty and organizational incentive structures motivate key stakeholder interactions during NPD processes. Specifically, we consider projects where the locus of responsibility shifts from one stakeholder to another as the project progresses to analyze the resource allocation decisions of the stakeholders.

025-0963 Single-sourcing versus multisourcing: the role of effort distortion

Alok Gupta, Professor, University Of Minnesota, United States
 Sameer Hasija, Assistant Professor, INSEAD, Singapore
 Shantanu Bhattacharya, Associate Professor, INSEAD, Singapore

We compare two strategies for the outsourcing of the development of information services projects -- multisourcing, where multiple vendors are used to deliver an information-based service, and single-sourcing, where a single vendor is used. We compare the strategies under task interdependence and effort distortion.

025-0774 Competitive Project Portfolio Management

Mark Zschocke, Student, University Of Waterloo, Canada
 Elizabeth Jewkes, Professor, University Of Waterloo, Canada
 Benny Mantin, Assistant Professor, University Of Waterloo, Canada

We consider firms' budget allocation decisions into mature and emerging markets. We prove that while the monopoly firm bases its budget allocation decision solely on the two markets' marginal returns, duopoly firms also account for two markets' average returns. This drives duopoly to invest more heavily into the mature market.

025-0619 Service Innovation in a Mobile Services Provider

Xiande Zhao, Professor, The Chinese University Of Hong Kong, Hong Kong
 Chris Voss, Emeritus Professor, London Business School, United Kingdom
 Qiang Wang, Student, The Chinese University Of Hong Kong, Hong Kong

We analyzed 70 service innovation projects from a mobile services provider to investigate the relationship between motivations for innovation, types of innovation, internal participation, external collaboration and service innovation outcomes. We also examined how some of these projects are implemented over time to discover the factors that influence long-term success.

290	Sunday, 04:30 PM - 06:00 PM, Los Angeles (Floor 5) <i>Track:</i> Production Planning and Scheduling <i>Session:</i> Applications of Production Planning and Scheduling II <i>Chair(s):</i> Debora Lobo
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025-1547 Control the production of bread: a case study of bakeries in Sao Paulo, Brazil

Joao Santos, Student, Universidade Metodista De Sao Paulo, Brazil
 Eduardo Santos, Student, Universidade Metodista De Sao Paulo, Brazil
 Wanderlei De Paulo, Professor, Universidade Metodista De Sao Paulo, Brazil
 Valdir Bernardo, Student, Universidade Adventista De Sao Paulo, Brazil

Shows the main techniques and systems of Planning and Production Control used in bakeries, strategies, concepts and issues that cause most difficulty in their production processes and suggest tools and systems that can be used by managers of bakeries in their planning and control the production.

025-1216 An optimal production scheduling model of hybrid flow shop - a case of solar cell industry

Chung Hsuan Tsai, Student, Tunghai University, Taiwan, Republic of China
 Li Chih Wang, Professor, Tunghai University, Taiwan, Republic of China
 Chin Wei Chang, Student, Tunghai University, Taiwan, Republic of China
 Chen Yang Cheng, Assistant Professor, Tunghai University, Taiwan, Republic of China

This paper developed a mixed integer linear programming model which can synchronously solve job sequencing, lot splitting, and machine allocation problems in a hybrid flow shop environment. Case study presents the proposed model comparing with solar cell industry practice in terms of minimum makespan.

025-0720 Comparison of logistics strategies of two cooperatives in the poultry sector using Stated Preference Technique

Debora Lobo, Associate Professor, State University of Western Parana (Unioeste), Brazil
 Honorio Conte, Master Student, Emater, Brazil

This article is a comparative study of two logistics strategies of Agribusiness Cooperatives in the poultry sector, in the western region of Brazil. The aim is to identify how these cooperatives agents order their supply preferences of corn to feed poultry industry. It was used Stated Preference Techniques.

291	Sunday, 04:30 PM - 06:00 PM, Northwestern (Floor 6) <i>Track:</i> Supply Management
	<i>Session:</i> Learning & Knowledge Management in Supply Management
	<i>Chair(s):</i> Daesik Hur

025-0669 Why Do Some Ideas Get Blocked on the Way?: The Process of Internalizing User Knowledge into the Organization

Ayaka Oda, Student, School of Business, Korea, Republic of (South Korea)
 Sung Joo Bae, Assistant Professor, School of Business, Korea, Republic of (South Korea)

In this study, we present a three-step process model of user knowledge internalization within the context of an online game company in Korea. We suggest that user knowledge gets internalized in the following order: 1) reception, 2) assignment, and 3) acceptance. For each step, we present a conceptual model.

025-1281 An Empirical Study of Antecedents and Effects of Integrative New Product Development Practices

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

Underpinned in the knowledge based view of the firm, this study postulates that developing a new product involves integrating knowledge, residing within and outside the organization. Three integrative product development practices are identified, and their antecedents and performance effects are tested using data collected from 208 Korean manufacturers.

025-1284 Complementarities of Supplier Development Programs and Social Capital in Supplier Learning

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

A supplier learns in both formal and informal ways from the buyer. The buying firm initiates formal supplier development programs to develop its core suppliers' capabilities. The supplier gains access and combines knowledge thru multiple social linkages with the buyer. We conduct field study to develop testable propositions.

292	Sunday, 04:30 PM - 06:00 PM, Ballroom C (Floor 5) <i>Track:</i> Healthcare Operations
	<i>Session:</i> Game Theoretic Applications in Healthcare Operations Management
	<i>Chair(s):</i> Tinglong Dai

025-0487 Competition Between Health Providers: Impact on Quality, Wait-time, Profitability, and Social Welfare

Ann Marucheck, Professor, University Of North Carolina Chapel Hill, United States
 Wendell Gilland, Associate Professor, University Of North Carolina Chapel Hill, United States
 Aaron Ratcliffe, Student, University Of North Carolina Chapel Hill, United States

We develop a competitive queuing model to investigate impacts of competition on quality, wait-time, profit and welfare in a healthcare setting with insured patients. We characterize Nash equilibrium monopoly and duopoly outcomes. We find social welfare loss due to duplication of quality effort and wait-time buffers when both providers enter.

025-0552 Optimal contracts for coordinating the pharmaceutical R&D supply chain

Shantanu Bhattacharya, Associate Professor, INSEAD, Singapore
 vibha gaba, Assistant Professor, INSEAD, Singapore
 Sameer Hasija, Assistant Professor, INSEAD, Singapore

We analyze optimal contracts in a R&D partnership between a risk-neutral pharmaceutical and a risk-averse biotech firm. The problem is formulated as a sequential investment game with double-sided moral hazard. Our research offers a systematic framework for choosing contracts to overcome agency problems encountered in the pharmaceutical R&D supply chain.

025-1177 Organ Priority Rules and Allocation Efficiency

Nilanjan Chakraborty, Senior Lecturer, Carnegie Mellon University, United States
 Katia Sycara, Professor, Carnegie Mellon University, United States
 Tinglong Dai, Student, Carnegie Mellon University, United States

This paper investigates the impact of priority rules on the efficiency of allocating donated organs. Through modeling the waiting time of different priority classes of patients for access to organs, our work extends the existing health economics literature and provides novel insights into understanding the issue.

293	Sunday, 04:30 PM - 06:00 PM, Kansas City (Floor 5) <i>Session:</i> Healthcare Modeling and Optimization II <i>Chair(s):</i> Shirley Li	<i>Track:</i> Healthcare Operations
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025-0592 Application of Drum-Buffer-Rope methodology in scheduling of health care system

Emmanuel Eneyo, Professor, Southern Illinois University Edwardsville, United States
 Arefeh Mohammadi, Student, Southern Illinois University Edwardsville, United States

Theory of Constraints (TOC) seeks to increase throughput of the system by identifying those processes that are constraining it. This study was conducted to determine how health care systems are utilizing components of TOC for scheduling patient flow. Drum-Buffer-Rope methodology is used for scheduling the radiotherapy section of a hospital.

025-0766 Optimizing patient contact: the tradeoff between serving a physician's office practice and hospital referrals

Eser Kirkizlar, Assistant Professor, Binghamton University, United States
 William Millhiser, Assistant Professor, Baruch College, United States
 Demetrios Karides, Neurologist, New York Hospital, United States

From empirical data we find solutions to three common operational problems in the US healthcare system when private-practice specialists provide care to community hospital inpatients: the ideal number of hours per day for hospital rounds, when referring physicians should be rejected, and the order in which inpatients should be seen.

025-1798 Absenteeism and Nurse Staffing

Diwakar Gupta, Professor, University Of Minnesota, United States
 Wen-Ya Wang, Student, University Of Minnesota, United States

We use data from multiple nursing units of two hospitals to study which factors, including unit culture, short-term workload, and shift type explain nurse absenteeism. This analysis forms the basis for a staffing model with heterogeneous nurses and a cost-effective methodology for medium and short-term staffing.

025-0935 A Multi-period Home Care Scheduling Problem with Work Balance

Shirley Li, Student, University Of Alabama Tuscaloosa, United States
 Burcu Keskin, Assistant Professor, University Of Alabama Tuscaloosa, United States

Despite the significant savings of home health care (HHC) services, many HHC agencies are challenged by operational expenses and inefficient utilization. We address this problem with work balance requirements over a finite planning horizon. Using a MILP with practical constraints for a real problem, we present solutions and insights.

294	Sunday, 04:30 PM - 06:00 PM, Wisconsin (WI) (Floor 6) <i>Session:</i> Conflicts and Strategies in Retail Operations <i>Chair(s):</i> Ruixia Shi	<i>Track:</i> Retail Operations
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025-0334 Advanced Selling and Price Discrimination Using Gift Cards in Service Supply Chains

Moutaz Khouja, Professor, University Of North Carolina Charlotte, United States
 Jing Zhou, Assistant Professor, University Of North Carolina Charlotte, United States

A service provider (SP) can sell its gift cards exclusively and/or through an independent retailer. We examine the conditions under which it is optimal for the SP to offer gift cards at an independent retailer and identify the optimal discount from the SP to the retailer.

025-1356 Bricks or Clicks: Strategic Analysis of Dual Channel Retail with Digital Goods

Yinliang (Ricky) Tan, Student, University Of Florida, United States
 Janice Carrillo, Associate Professor, University Of Florida, United States

The advent of digital goods has made a significant impact on traditional markets for items such as videos and books. We study decision strategies facing retailers by formulating a dual channel model that conceptualizes the influence of customers' acceptance of digital goods on supply chain design decisions.

025-0855 Store Brands and Channel Power

Jun Zhang, Assistant Professor, University Of Texas Dallas, United States
 Jun Ru, Assistant Professor, University Of Buffalo, United States
 Ruixia Shi, Assistant Professor, University Of Richmond, United States

This paper relates a retailer's store brand strategy to the relative powers of channel members and offers a new explanation for the differences in retailers' store brand strategies and shifts in these strategies over time.

025-1777 Cooperative Advertising in a "Two Manufacturer-Single Retailer" Supply Chain

Xiaohang Yue, Associate Professor, University Of Wisconsin Milwaukee, United States
 Qinglong Gou, Associate Professor, University Of Science & Technology, China
 Chunxu Wu, Associate Professor, University Of Science & Technology, China
 Yi He, Professor, University Of Science & Technology, China

Cooperative advertising is a common cooperative approach between the manufacturer and the retailer. This paper focuses on the cooperative advertising problem in a "two manufacturers and single retailer" framework and studies the equilibrium advertising strategies of each channel member in three different scenarios.

295	Sunday, 04:30 PM - 06:00 PM, River North (Floor 2)	<i>Track:</i> OM in Latin America and the Caribbean
	<i>Session:</i> Lean and Quality in Latin America	
	<i>Chair(s):</i> Zoila Castillo	

025-0121 Applying Lean techniques to nougat fabrication: A seasonal case study

Javier Santos, Professor, TECNUN, Spain
 Martin Tanco, Associate Professor, Universidad De Montevideo, Uruguay
 Jose Rodriguez, Student, Universidad De Montevideo, Uruguay
 Juan Reich, Student, Universidad De Montevideo, Uruguay

The aim of this case study is to show the applicability of Lean Manufacturing in a different environment: a SME chocolate industry located in South America. Several techniques were carried out such as VSM, Overall Equipment Efficiency (OEE), Spaghetti diagrams, Work Balance, discrete event simulation and Experimentation.

025-0264 Lean manufacturing implementation: An exploratory study of Brazilian companies

Dalvio Tubino, Associate Professor, Departamento de Engenharia de Produção e Sistemas, Brazil
 Raúl Poler, Associate Professor, Universidad Politecnica De Valencia, Spain
 Glauco da Silva, Student, Departamento de Engenharia de Produção e Sistemas, Brazil

This paper surveys 79 Brazilian companies following their implementation of lean manufacturing. We identified a strong correlation between practice and expected performance. We also found that lean manufacturing achieves better results when implemented by large companies, although can also work well for medium- and small-sized companies.

025-0747 Continuous Improvement in Puebla, Mexico: A Survey

Jaime Contreras, Consultant, Consultant, Mexico
 Luis Borges, Assistant Professor, Saint Xavier University, United States

In search of Excellence companies must use techniques to improve their processes. A literature review and a survey conducted in the industrial area of Puebla, Mexico. It follows a longitudinal survey on selected respondents. Results show where organizations have decided to put their resources in order to achieve such improvements.

025-0881 Uncertainty in the Panama Canal operations management

Zoila Castillo, Professor, Universidad Tecnologica de Panama, Panama
 John Jackman, Associate Professor, Iowa State University, United States

The objective of this research is to characterize the uncertainty in Panama Canal operations and identify factors that contribute to uncertainties, so that new technologies can be introduced and real-time operational decisions can be made that will result in significant reductions in the mean and variance of the transit time.

296	Sunday, 04:30 PM - 06:00 PM, Cook (Floor 3)	<i>Track:</i> Supply Chain Risk
	<i>Session:</i> Extreme Events, Disasters and Sustainability	
	<i>Chair(s):</i> Suzanne de Treville	

025-0119 ANP Disruption Simulation for Supply Chains due to Macro Risks

Matthias Klumpp, Professor, FOM ild at FOM University of Applied Sciences, Germany
 Hella Abidi, Student, FOM ild at FOM University of Applied Sciences, Germany

Supply chain risk management becomes recently important for researcher and practitioner. Therefore this research paper aims to develop risk controlling measurement system by applying a soft operation research method, analytical network process (ANP), for a global supply chain in case of disruption by an environmental risk such as natural disasters.

025-0793 Handling Disruptions in Supply Chain: An Integrated Framework and an Agent-Based Model

Zofia Lukszo, Associate Professor, Delft University of Technology, Netherlands
 Behzad Behdani, Student, Delft University of Technology, Netherlands

Two common views on handling supply chain disruptions, namely "pre-disruption" and "post-disruption" views, are discussed, critically evaluated and combined in an "Integrated Framework to Handle Disruptions in Supply Chain". Subsequently, an agent-based modeling approach is described to support the decision making in the relevant steps of the presented integrated framework.

025-1063 The Business Tsunami Mindset: Surviving Disruptive Change in High-tech Supply Networks

Henk Akkermans, Professor, Tilburg University, Netherlands
 Luk Van Wassenhove, Professor, INSEAD, France

In our interconnected world, with its fragmented supply networks, major disruptive and unexpected changes hit companies with disastrous effects. We call these, business tsunamis. Based on a case study of a high-tech capital equipment manufacturer, we describe the managerial mindset required to deal with such discontinuities effectively.

025-1399 Risk Management in Sustainable Supply Chains

Mihalis Giannakis, Associate Professor, University Of Warwick, United Kingdom

This paper explores and assesses a large number of risks, specifically in sustainable supply chains and proposes different risk mitigation strategies for each risk category. 54 risk factors in 10 risk categories are identified through an extensive literature review and analysed with in-depth case studies to propose risk mitigation strategies.

025-1429 Using Extreme Value Theory to Think the Unthinkable in the Supply Chain

Suzanne de Treville, Professor, Université de Lausanne, Switzerland
 Vinod Singhal, Professor, Georgia Institute Of Technology, United States
 Valérie Chavez-Demoulin, Assistant Professor, Université De Lausanne, Switzerland

How bad can things get if they go wrong, or good if they go right? Failure to consider the tail of a heavy-tailed outcome distribution can lead to poor decision making. Extreme value theory incorporates heavy-tailedness into decision making, but requires a radical rethinking of fitting and interpreting distributions.

297	Sunday, 04:30 PM - 06:00 PM, Ballroom G (Floor 5) <i>Session:</i> Service Outsourcing <i>Chair(s):</i> Sameer Hasija	<i>Track:</i> Service Operations
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025-1175 Optimal Contracts for Outsourcing of Repair and Restoration Services

Sameer Hasija, Assistant Professor, INSEAD, Singapore
Dana Popescu, Assistant Professor, INSEAD, Singapore
Nitish Jain, Student, INSEAD, Singapore

Outsourcing of repair services creates double-sided moral hazard issues since the system performance is determined by joint efforts of the client and the vendor. Additionally, performance-based contracts coupled with stochasticity in the service performance may raise financial concerns for the vendor. We present optimal contracts that resolve such agency issues.

025-1615 Considering Service Quality in a Two-Stage Service Process

Azin Farzan, Student, University Of Washington, United States
Yong-Pin Zhou, Associate Professor, University Of Washington, United States

We analyze service quality in a two-stage service process. Customer satisfaction is determined by effort at both that and the preceding stages. We consider decentralized and outsourcing scenarios and devise a coordination mechanism. We also investigate the role of pooling when multiple first-stage clients outsource to the same second-stage firm.

025-1525 Designing Performance Measurement Systems for Complex Services

Andy Neely, Professor, University Of Cambridge, United Kingdom
John Mills, Associate Professor, Cambridge University, United Kingdom

It has long been recognised that performance measures should be aligned with organizational goals and strategy, but many complex services are delivered by networks of organisations working collaboratively. This paper explores how to design performance measurement systems at the network level rather than relying on organisational performance measurement systems.

298	Sunday, 04:30 PM - 06:00 PM, Miami (Floor 5) <i>Session:</i> Capacity Management under Competition <i>Chair(s):</i> Izak Duenyas	<i>Track:</i> Capacity Management
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025-0836 Collaboration between competitors

Roman Kapuscinski, Professor, University Of Michigan Ann Arbor, United States
Liang Ding, Student, University Of Michigan Ann Arbor, United States
Ozge Sahin, Assistant Professor, Johns Hopkins University, United States

Some companies engage in partnerships with their competitors. To study this collaborative/competitive relationship we assume that two firms buy products independently, have an opportunity to trade products, and then sell them in two linked markets. We study when such collaborations increase profitability of both firms.

025-0845 Event Revenue Management with Resale

Izak Duenyas, Professor, University Of Michigan Ann Arbor, United States
Ozge Sahin, Assistant Professor, Johns Hopkins University, United States
Yao Cui, Student, University Of Michigan Ann Arbor, United States

We develop a consumer behavior model of ticket purchase/resale in which buyer's purchasing decision in the primary market is based on the outcomes of the resale market and valuation uncertainty. We analyze the optimal pricing strategy in the presence of a secondary market.

025-1715 Capacity Option Transfer Rights: When and How Do They Benefit Suppliers?

Izak Duenyas, Professor, University Of Michigan Ann Arbor, United States
Seyed Iravani, Professor, Northwestern University, United States
Linlin Li, Student, Northwestern University, United States

We consider situations where firms buy option to use the capacity of suppliers. We explore under what conditions a supplier should provide to its buyers the transfer rights such that, a buyer that cannot use all its reserved capacity can sell it to another buyer that may need more.

299	Sunday, 04:30 PM - 06:00 PM, Minnesota (MN) (Floor 6) <i>Session:</i> Statistical and Computational Inventory Management <i>Chair(s):</i> Martin Stößlein	<i>Track:</i> Inventory Management
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025-1538 The Order Penetration Point in the Steel Industry: A Hybrid Optimization-Simulation Approach

Samuel Conceicao, Professor, Univ Federal Do Minas Gerais, Brazil
Eguinaldo Souza, Instructor, Federal University of Minas Gerais, Brazil
Eliane Wolff, Dr., WW Company, Brazil

Based on the concept of order penetration point we propose three different manufacturing approaches to optimize semi-finished inventories in the steel industry in Brazil. We developed a hybrid optimization-simulation model to evaluate the performance of the system. The results shows that we can achieve shorter lead times and production efficiency.

025-0748 Statistical Inventory Management: Intermittent Demand

Alp Akcay, Student, Carnegie Mellon University, United States
Bahar Biller, Associate Professor, Carnegie Mellon University, United States

Sridhar Tayur, Professor, Carnegie Mellon University, United States

Considering an intermittent demand process in a repeated newsvendor setting, we propose a joint estimation-optimization approach to estimate inventory targets from limited demand data. Application to actual intermittent demand data demonstrates the effectiveness of our approach in reducing inventory costs and improving service levels.

025-1808 Time-Phased Safety Stocks Planning and its Financial Impacts: Econometrical Evidence from Ten European Economies

Martin Stoesslein, Assistant Professor, Technische Universitat Munchen, Germany

Jack Kanet, Professor, University Of Dayton, United States

Michael Gorman, Professor, University Of Dayton, United States

Stefan Minner, Professor, Technische Universitat Munchen, Germany

This presentation aims at further exploring the value of time-phased safety stock planning. We argue that its planning is prudent when faced with non-stationary processes. To test the phenomenon and to estimate its impacts, we have conducted an econometric analysis using EUROSTAT data of major European economies from 1985 onwards.

Sessions for Monday, April 23

Monday, 08:00 AM - 09:30 AM

301	Monday, 08:00 AM - 09:30 AM, Scottsdale (Floor 5)	<i>Track:</i> Behavioral Operations
	<i>Session:</i> Behavioral Operations Management	
	<i>Chair(s):</i> Yan Cimon Rosemond Moore	

025-0514 Cognitive Engineering for Interactive Scheduling Algorithms

W. van Wezel, Assistant Professor, University Of Groningen, Netherlands

Many interactive scheduling algorithms are described in literature, but application in practice is still limited. To explain this theory/practice gap, we analyze usability and cognitive aspects of interactive scheduling algorithms. We conclude that interaction is mostly used to compensate for shortcomings of algorithms rather than to support the human scheduler.

025-0231 Computational Replications of the Lab Experiments in Combinatorial Auctions through Agent-based Simulations

Whan-Seon Kim, Associate Professor, Myongji University, Korea, Republic of (South Korea)

With the FCC's data from the laboratory experiments on spectrum auction with human subjects, individual bidders' bidding behaviors are modeled in terms of derived behavioral rules and associated parameter values. Then, the auction outcomes are replicated by employing Agent-based Simulation method so that computational experiments can be performed further on.

025-1598 A behavior-based scheduling model toward delivery delay for segmented customers in urban distribution systems

Lirong Wu, Student, Dalian University Of Technology, China
Xiangpei Hu, Professor, Dalian University Of Technology, China

This paper studies the scheduling issue concerning delivery delay in urban distribution systems according to customers' attitude. We firstly segment customers, and then apply prospect theory to represent customer's behavior or attitude towards delivery delay. At last, we setup the scheduling model embedding behavioral variables in.

025-1476 Decisions and High-reliability Environments

Simon Veronneau, Assistant Professor, Quinnipiac University, United States
Yan Cimon, Associate Professor, Universite Laval, Canada

High reliability environments have been known to pose various sets of challenges to human-driven decision making efforts. We delineate these challenges and suggest original and implementable solutions to this conundrum. It is shown that augmented reality and an environment with better information architecture will be an asset.

025-0120 Identifying Elements of a Climate for Sustainability

Rosemond Moore, Student, University Of Texas Pan American, United States

Sustainable development is eloquently defined by WCED as an organization's responsibility to meet present economic needs without detrimental impact to future societal or environmental needs. This suggests that sustainability has three distinct dimensions. This research extends the sustainability literature utilizing Content Analysis to identify elements of a "climate for sustainability."

302	Monday, 08:00 AM - 09:30 AM, Lincolnshire II (Floor 6)	<i>Track:</i> Empirical Research in OM
	<i>Session:</i> Empirical Research in OM IV	
	<i>Chair(s):</i> Muhammad Ahmed	

025-1101 The Impact of Functional Importance and Capability before & during Recession: Operations and Marketing Compared

Muhammad Ahmed, Student, York University, Canada
Murat Kristal, Associate Professor, York University, Canada
Mark Pagell, Professor, York University, Canada

This paper looks at how importance given to operations and marketing impacts their capability and firm performance. We study these relationships before and during the economic recessions of 2001 and 2008. Results indicate that the relationships change during recessions, though operations capability remains important at all times.

025-1089 An Invariance Analysis of the Instruments of Product Development Flexibility under Environmental Uncertainty

Mei Cao, Assistant Professor, University of Wisconsin Superior, United States
Qingyu Zhang, Associate Professor, Arkansas State University, United States

This research organized literature on product development flexibility according to competence and capability theory. It developed valid and reliable instruments for product development flexibility and its related constructs. Using large-scale survey data, the paper conducted an invariance analysis of these instruments under high vs. low environmental uncertainty.

025-0217 Investigating the Existence of BWE Paradox in US Supply Chain

Sima Fortsch, Student, Suny At Buffalo, United States
Winston Lin, Associate Professor, Suny At Buffalo, United States

This research is an in-depth study of BWE paradox. The data was obtained from the US-Census from 1992 to 2010. Results of causalities show that both BWE and reverse BWE are present in the US supply Chain.

025-1137 Estimation of Project Duration in Multiple Project Environments

Vishwanath Hegde, Associate Professor, California State University East Bay, United States
Edward Nakayama, Engineer, California State University East Bay, United States

Estimation of project duration in complex multi-project setting is largely unexplored. This study analyzes actual resource usage data over eleven years at a public works agency. We analyzed resource loading patterns and project durations in this longitudinal data. Further, we identify the variables that impact project durations in multi-project settings

303	Monday, 08:00 AM - 09:30 AM, Ohio State (Floor 6) <i>Session:</i> Issues in Food Supply Chains in Humanitarian Operations <i>Chair(s):</i> Burcu Balcik	<i>Track:</i> Humanitarian Operations and Crisis Management
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025-1614 Food Banks Logistics: Building a Supply-Driven Value Chain
Rafael Gomez, Professor, Ipade Business School, Mexico
Jesus Orozco, Assistant Professor, Ipade Business School, Mexico

Food banks are civil organizations that collect donated edible products with low market value to distribute them to needy communities. Their logistics system is designed to provide quick response at low costs. In this paper, we propose a simulation-based decision support system to assess alternatives in a Mexican food bank.

025-0665 Supplier Selection for Framework Agreements in Humanitarian Relief
Burcu Balcik, Assistant Professor, Ozyegin University, Turkey

We consider a relief organization, which is interested in establishing framework agreements with a number of suppliers for procurement of a single relief commodity to respond to quick-onset disasters. We develop a two-stage stochastic programming model to support supplier selection decisions of relief organizations under demand uncertainty.

025-1318 Effective Volunteer Management in Humanitarian Operations
Shenghan Xu, Assistant Professor, University Of Idaho, United States

Most humanitarian efforts use volunteers to support their missions. We examine the operational challenges of heavily relying on volunteerism. In addition to the managerial strategies, we also propose mixed-integer programming based approaches that improve the operation efficiency as well as the satisfaction of the volunteers.

025-1599 Supply Chain Challenges in Feeding Hungry People - from Chad to Chicago
Paul Larson, Professor, University Of Manitoba, Canada
Gerry Maguire, Vice President of Supply Chain, Greater Chicago Food Depository, United States

This session discusses supply chain challenges and research opportunities in not-for-profit food distribution, i.e. feeding hungry people. Around the world, from Chad to Chicago, there are growing numbers of hungry people. SCM literature is merged with insights from practice to develop ideas on making these important supply chains more effective.

304	Monday, 08:00 AM - 09:30 AM, Purdue (Floor 6) <i>Session:</i> Operations-Marketing Models <i>Chair(s):</i> Maria Gouvea	<i>Track:</i> Marketing and OM Interface
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025-1690 The Retail Shelf Space Optimization Problem: Math Models, Heuristics and Metaheuristics
Anurag Agarwal, Associate Professor, University Of South Florida, United States
James Curran, Associate Professor, University Of South Florida, United States

The in-store retail industry, which has traditionally been very competitive, is facing growing competition from online retailers. Retail shelf space optimization, therefore, has become critical for success in in-store retailing. This paper proposes some new mathematical models for this problem, and proposes some heuristic and metaheuristic approaches to solve them.

025-1445 Aspects Related to Consumer Behavior in the Context of Online Retailing
Henrique Verissimo, Student, University Of São Paulo, Brazil
Maria Gouvea, Associate Professor, University Of São Paulo, Brazil

This paper aims to develop a model that relates antecedent factors to online purchase intention and tests its adherence to the data collected in a survey with a convenience sample formed by 743 Brazilian consumers.

025-1413 Banner Ad Scheduling Models for Multiple Web Sites under Variable Display Frequency
Anurag Agarwal, Associate Professor, University Of South Florida, United States
Jason Deane, Assistant Professor, Virginia Polytechnic Institute And State University, United States

Existing models in the literature on banner ad scheduling assume that the requested ads are displayed on a single web site. In practice, customers expect their requested frequency of ads to be distributed across multiple web sites. This paper proposes a multi-website banner ad scheduling model and also

305	Monday, 08:00 AM - 09:30 AM, Great America II (Floor 6) <i>Session:</i> Operational Design Principles <i>Chair(s):</i> Michael Dixon	<i>Track:</i> OM Practice
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025-1026 Service Design using PCN Diagrams
Scott Sampson, Professor, Brigham Young University, United States

Traditionally, service designers have lacked the rigorous tools that product engineers have at their disposal. Process-Chain-Network (PCN) Analysis was developed to address that need. This presentation will introduce PCN Diagrams and PCN Analysis and show how they can be used to depict and analyze the distinctive operational issues of services.

025-1091 The effect of high demand on hospital readmissions
Anita Tucker, Associate Professor, Harvard University, United States
Jillian Berry, Student, Harvard University, United States

Using data on every hospital discharge from California from 2005-2009, we can calculate a daily census for each hospital and follow patients across time and hospitals. We then examine the effects of busyness on patient care, with a focus on the role a hospital census plays on patient readmission rates.

025-1386 Demand Modeling and Inventory Decisions for Online Movie Rental at Blockbuster

Chelliah Sriskandarajah, Professor, University Of Texas Dallas, United States
Casey Chung, Director WFC , Gap Inc., United States
Shun-Chen Niu, Professor, University Of Texas Dallas, United States
Kyung Sung Jung, Student, University Of Texas Dallas, United States

We model the demand of new DVD releases for the subscriber-based online movie rentals, determine the initial order quantity of the DVD, and position the DVDs among the distribution centers to prevent costly misallocation. Movie-specific characteristics and customer behavior are also considered using data from Blockbuster to justify our approach.

025-1143 Antecedents and Outcomes of Improvisation Competence in Services

Enrico Secchi, Student, Clemson University, United States
Aleda Roth, Professor, Clemson University, United States
Rohit Verma, Professor, Cornell University, United States

By applying Organizational Improvisation theory to service environments, we develop a comprehensive theory of Service Improvisation Competence. Using insights from service delivery design research, we discuss the expected outcomes of improvisation based on its alignment with the service concept and the target market.

306	Monday, 08:00 AM - 09:30 AM, Dupage (Floor 3)	<i>Track:</i> Scheduling and Logistics
	<i>Session:</i> Logistics II	
	<i>Chair(s):</i> Abey Kuruvilla	

025-0545 The problem of consolidation in the groupage process: formulation and solution approaches

Abey Kuruvilla, Assistant Professor, University of Wisconsin Parkside, United States
Tommaso Paletta, Student, Universita Della Calabria, Italy

We address a new mathematical formulation of the problem of consolidation, adding constraints to formulations in the literature (Knapsack and 3D Bin Packing problems). We present some lower bounds and two new heuristic algorithms to solve the problem and compare the heuristic solutions with exact solutions obtained using ILOG CPLEX.

025-0543 A new algorithm for minimizing makespan on identical parallel machines

Abey Kuruvilla, Assistant Professor, University of Wisconsin Parkside, United States
Giuseppe Paletta, Professor, Universita Della Calabria, Italy

A heuristic algorithm is developed for the classical multiprocessor scheduling problem where independent jobs are non-preemptively scheduled on identical parallel machines with the objective of minimizing makespan. The algorithm uses iteratively the LPT procedure followed by the MultiFit procedure on different job sets. Effectiveness is evaluated through computational comparisons with other methods.

025-0985 Applying a BITESIZE lean change methodology to intermodal terminal operations

Daryl Powell, Student, NTNU, Norway
Erik Gran, Research manager, Sintef Teknologiledelse, Norway

Though lean has been applied successfully in manufacturing since the 1990s, applications within intermodal freight terminals are lacking. We apply a BITESIZE lean change methodology to a Norwegian intermodal terminal, and demonstrate the applicability of a selection of lean tools and techniques for improving material flow through the terminal.

025-1365 Groupage transportation cost model

Fabio Sgarbossa, Assistant Professor, University of Padua, Italy
Daria Battini, Assistant Professor, University of Padua, Italy
Maurizio Faccio, Assistant Professor, University of Padua, Italy
Alessandro Persona, Professor, University of Padua, Italy

Today it is very common to use freight groupage to collect or deliver products. Even in the management of services is often used routing problem to optimize the mission of the operators. The estimate of actual costs is complex and influenced by many variables, so the authors suggest a new approach easy to apply in real cases.

307	Monday, 08:00 AM - 09:30 AM, Ballroom A (Floor 5)	<i>Track:</i> Sustainable Operations
	<i>Session:</i> Transportation, Emissions, and Reverse Logistics	
	<i>Chair(s):</i> Nazli Turken	

025-0249 Sustainable Design Practices and Market Entry Strategies: Building a New Transportation System in Israel

Ednilson Bernardes, Associate Professor, Georgia Southern University, United States
Cheryl Druehl, Assistant Professor, George Mason University, United States
Michael Naor, Assistant Professor, George Mason University, United States

This study investigates practices to design and disseminate innovations for sustainable business. A case study methodology is used to illustrate how new product development combined with strategic market entry can overcome consumer's barriers in order to establish a sustainable transportation system for electric cars in Israel.

025-0459 When do Emissions Reductions Improve Profits?

Brian Jacobs, Assistant Professor, Michigan State University, United States
Sachin Modi, Assistant Professor, University Of Toledo, United States
David Closs, Professor, Michigan State University, United States
Sriram Narayanan, Assistant Professor, Michigan State University, United States

Empirical evidence of the relationship between firm-level emissions reductions and financial performance is often conflicting and inconclusive. Using data collected from TRI and Compustat, we demonstrate that this heterogeneity is driven by both the industry's dirtiness and the firm's operational capabilities. Further, we show that the impact of emissions reductions

025-0715 Reverse Logistics Network Design with Random Returns

Tharanga Rajapakshe, Assistant Professor, University Of Florida, United States
 Asoo Vakharia, Professor, UF, United States
 Lan Wang, Student, University Of Florida, United States

In order to determine the optimal location of recycling centers which serve as intermediate distribution facilities and refurbishing center between retailers and secondary markets, we proposed a model attempting to minimize the total cost of implementation of the reverse logistics channel with randomness of the returns taken into consideration.

025-1363 Environmental Implications for Strategic Supply Chain Decisions: The Role of Location and Scale

Janice Carrillo, Associate Professor, University Of Florida, United States
 Nazli Turken, Student, University Of Florida, United States

In this paper, we investigate the environmental effects of plant size and location decisions. We consider capacity expansion and scale choices, given regional and national regulations on emissions. Next we incorporate transportation decisions into the model to capture the trade-off between plant size and the dispersion of the supply chain.

308	Monday, 08:00 AM - 09:30 AM, Denver (Floor 5)	<i>Track:</i> Sustainable Operations
	<i>Session:</i> Environmental Issues and Energy Consumption	
	<i>Chair(s):</i> Howard Ralph	

025-1302 Modelling buildings, facilities and manufacturing operations to reduce energy consumption

Peter Ball, Senior Lecturer, Cranfield University, United Kingdom

The paper presents a literature review, develops the conceptual modelling approach and introduces a prototype modelling tool as applied to industrial case studies to support activities towards sustainable manufacturing. The work considers buildings, facilities and operations as an integrated system for modelling energy flows.

025-1662 When the Curtain Falls on the Final Act: A Study of Closure Operations

Howard Ralph, Assistant Professor, Clayton State University, United States

The closure of mature industrial operations at the end of the lifecycle often leaves a blighted area much closer to retail, housing, community activity and other centers of urban life than originally established. An examination of successes and failures yields understanding of the most effective use of withdrawal resources.

025-1384 Delivering Built Environment Projects through the Lens of Sustainability

Young Hoon Kwak, Associate Professor, George Washington University, United States
 Changbum Ahn, Student, University Of Illinois Urbana-Champaign, United States
 SangHyun Lee, Assistant Professor, University Of Michigan Ann Arbor, United States
 Feniosky Pena-Mora, Professor, Columbia University, United States
 Jane Park, Student, George Washington University, United States

To help understand the rationale behind proactive environmental strategies in built environment projects, this study tries to: 1) identify a mechanism that improves environmental performance during the engineering-construction lifecycle without compromising economic performance; and 2) find opportunities for sustainable built environment construction projects through adopting environmentally-conscious practices.

025-1496 Lean Methods and Environmental Problems

Lumbidi Kupanhy, Professor, Wakayama University, Japan

This presentation intends to shed more light on immense but unexplored, untapped and unexploited potentials of Lean methods in Japan from the environmental perspective. In fact, Lean methods not only constitute an ecologically viable, sustainable and environment-friendly production system, but they can be used to solve environmental problems in general.

310	Monday, 08:00 AM - 09:30 AM, Illinois (IL) (Floor 6)	<i>Track:</i> Manufacturing Operations
	<i>Session:</i> Manufacturing Control & Measurement	
	<i>Chair(s):</i> Pratap Mohapatra	

025-0620 A New Approach to Design of Fuzzy Multi-Attribute Control Charts

KVN Anjani Kumar, Student, Indian Institute Of Technology Kharagpur, India
 Pratap Mohapatra, Professor, Indian Institute Of Technology Kharagpur, India

This paper designs control charts for subjectively estimated multiple-attribute quality characteristics. Aggregate sample quality is estimated by using interactive weighted addition of fuzzy values assigned to each quality characteristic. Control charts are drawn using possibility and necessity measures. This approach helps to identify quality characteristics responsible for out-of-control situations.

025-1110 Attributes of the PPC environment designed for enterprise networks: implications for a business unit of the me

José Sacomano, Professor, Universidade Paulista - Unip, Brazil
 José Barrozo de Souza, Student, Universidade Paulista, Brazil
 Francisco José Santos Milreu, Professor, Universidade Paulista, Brazil
 Ana Lucia Atrasas, Analyst, Universidade Paulista/ Embrapa, Brazil
 Sérgio Luiz Kyrillos, Student, Universidade Paulista, Brazil

The production management is one of the most significant issues related to managing operations, requiring constant study to keep business units in the face of a competitive global market that is changing quickly. Then structure systems capable of clumping companies inserted in network environments requires a different view on the PPC.

025-1440 Competitive strategy with social and environmental responsibility in the MVM - Jeanswear Segment

Fabiana Lima, Student, Universidade Paulista - Unip, Brazil
 José Sacomano, Professor, Universidade Paulista - Unip, Brazil
 Francisca Mendes, Professor, Universidade De Sao Paulo, Brazil

The Jeanswear Segment is one of the most complexes in the Fashion Clothing Manufacturing - MFC covering a wide range of industries. The laundry process strengthens the Differentiation Leadership. A creative project of a small Brazilian company reuses 90% of the water and discards the remaining obeying all environmental legal.

311	Monday, 08:00 AM - 09:30 AM, Ballroom B (Floor 5)	<i>Track:</i> Supply Chain Management
	<i>Session:</i> ERP, Collaboration, and S&OP	
	<i>Chair(s):</i> Mahesh Srinivasan	

025-0075 Alignment between business strategy and supply chain strategy: Impacts on firm performance

Susita Asree, Assistant Professor, Winston Salem State Univ, United States
 Emily Christiansen, Instructor, The University Of Scranton, United States
 Sufian Qrunfleh, Assistant Professor, The University Of Scranton, United States

This paper investigates the alignment between typologies for business strategy and supply chain strategy. We develop hypotheses proposing that alignment between business strategy (exploitation and exploration), and supply chain strategy (lean and agile) respectively, enhances firm performance. Our empirical results based on structural equation modeling suggest that exploitation/lean supply chain strategy and exploration/agile supply chain strategy combinations are associated with improved firm performance. The study contributes to the supply chain management literature by identifying two types of alignments with business strategy.

025-1383 Supplier integration in innovation ecosystems: the lens of collaborative relationships

Fabio Tescari, Student, Fundacao Getulio Vargas, Brazil
 Roberto Sedyama, Student, Fundacao Getulio Vargas, Brazil

One of the great challenges of innovation is the effort of developing an ecosystem capable of delivering the support needed by the focal company. We present a case study by the lens of collaborative buyer-supplier relationships with companies that have integrated their suppliers on the innovation process.

025-0038 Integrating ERP Benefits and Competitive Priorities

Oscar Bustinza, Associate Professor, University Of Granada, Spain
 Carmen Haro-Dominguez, Associate Professor, University Of Granada, Spain
 M^a Nieves Perez-Arostegui, Associate Professor, University Of Granada, Spain
 Daniel Arias-Aranda, Professor, University Of Granada, Spain

By analyzing European firms that have implemented ERP, this investigation aims to study the appropriateness of ERP benefits to the firm's competitive priorities. The results confirm the positive relationship of the benefits in operations, management and IT infrastructure that implementing an ERP system provides for the firm's competitive priorities.

025-1119 Managing ERP Systems and Enterprise Strategy: A Dynamic Enterprise Reference Grid

Yi Wan, Student, Aston University Birmingham, United Kingdom
 Ben Clegg, Associate Professor, Aston University Birmingham, United Kingdom
 Prasanta Dey, Associate Professor, Aston University Birmingham, United Kingdom

This paper investigates how enterprise resource planning (ERP) systems can influence enterprise management strategy and structure and vice versa. The research provides an up-to-date literature review, empirical case studies and proposes a new conceptual model - the Dynamic Enterprise Reference Grid for ERP (DERG-ERP) - as a management contingency framework.

312	Monday, 08:00 AM - 09:30 AM, Houston (Floor 5)	<i>Track:</i> Supply Chain Management
	<i>Session:</i> Supply Chain Alignment	
	<i>Chair(s):</i> Sufian Qrunfleh	

025-0416 Do companies align their supply chain strategy with changing economic scenarios? A longitudinal view.

Mark Pagell, Professor, York University, Canada
 Frank Wiengarten, Assistant Professor, Esade Business School, Spain

This study explores the impact of economic upheavals on supply chain strategy and performance using longitudinal data collected in the German automotive industry before and after the recent economic crises. The results indicate that SCM strategies and performance outcomes change with the economy suggesting that SCM strategy cannot be static.

025-0803 Enabling supply chain efficiencies through technology and process integration: A framework

Chandrasekaran Nagarajan, Vice-president, Take Solutions Pvt. Ltd., India
 Ramasubramaniam Muthurathnasabapathy, Assistant Professor, Loyola Institute of Business Administration, India

Supply chain efficiencies have been the central theme of a focal organization in designing and implementing supply networks. In this paper, a framework of technology application in a supply chain network of vertically integrated firms with a large focal firm being the driver is analyzed with a focus on supplier relationship.

025-1700 The Role of the Salesperson in Building Trust and Collaboration in Supply Chain Relationships

Mahesh Srinivasan, Assistant Professor, University Of Akron, United States
 Prashant Srivastava, Assistant Professor, University Of Akron, United States

This paper examines the impact of the antecedents of salesperson trust on development of trust in a buyer-supplier relationship. The moderating roles of supply risks on this association are also examined in the context of established business-to-business buyer-salesperson relationships. The theoretical and practical ramifications of these findings and discussed.

313	Monday, 08:00 AM - 09:30 AM, Watertower (Floor 10)	<i>Track:</i> OM and Economic Models
	<i>Session:</i> Cooperation and Competition in Supply Chains	
	<i>Chair(s):</i> Greys Sosic Che-Lin Su	

025-0477 Capacity Investment of Start-ups and Established Firms In a Vertically Differentiated Market

Gang Wang, Student, University Of North Carolina Chapel Hill, United States
 Lauren Xiaoyuan Lu, Assistant Professor, University Of North Carolina Chapel Hill, United States

We analyze how the quality differentiation affect the capacity dynamics of start-ups and established firms. We find that a start-up tends to take a capacity lagging strategy for its high quality product in a vertically differentiated market, and capacity investment dynamics critically depends on quality differentiation.

025-0083 Equilibrium in Queues under Unknown Service Rates and Service Value

Senthil Veeraraghavan, Associate Professor, University Of Pennsylvania, United States
 Laurens Debo, Associate Professor, University Of Chicago, United States

We study a single queue joining equilibrium when there is uncertainty in the consumers' minds about the service rate and value. Without uncertainty, the joining equilibria are characterized by means of a single threshold queue length above which consumers do not join. This is not sufficient with uncertainty.

025-1020 On Estimating Pure Characteristics Models

Che-Lin Su, Assistant Professor, University Of Chicago, United States

A pure characteristics model (PCM) is a class of random-coefficients demand models in which there is no idiosyncratic logit error term in a consumer's utility. We formulate the GMM estimation of a PCM as a mathematical program with equilibrium constraints. We discuss the computational challenges in estimating these models.

025-1225 Groupon for Services: Is it a good deal?

Ramandeep Randhawa, Assistant Professor, University Of Southern California, United States
 Guangwen Kong, Student, University Of Southern California, United States

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

314	Monday, 08:00 AM - 09:30 AM, Ballroom F (Floor 5)	<i>Track:</i> Product Innovation and Technology Management
	<i>Session:</i> Innovation in Networks	
	<i>Chair(s):</i> Roberto Revetria	

025-0572 Open innovation: An analysis of publications, citations and scientific collaboration between 2003 and 2011

Ana Paula Lopes, Student, University Of São Paulo, Brazil
 Marly Carvalho, Associate Professor, Polytechnic School Of Sao Paulo, Brazil

Nowadays the idea are created inside and outside in the organizations. The main objective of this article is to understand the publication patterns of open innovation, focusing on aspects related publications, citations and scientific collaboration, between 2003 and 2011. For this, the authors performed a bibliometric study with content analysis.

025-0223 Business Networks: Technology transference to the agribusiness - Embrapa case

Ana Lucia Atrasas, Analyst, Universidade Paulista/ Embrapa, Brazil
 José Sacomano, Professor, Universidade Paulista - Unip, Brazil

This study seeks to understand how the relationship of technology transfers from the external environment with Embrapa. We analyzed the evolution and subsequent transformation of vision that the company has undergone. At the end you can see the network cohesion and the convergence of the interests of its participants.

025-1311 An innovative approach to support decisions in the supply chain network

Roberto Revetria, Professor, University of Genoa, Italy
 Guido Guizzi, Assistant Professor, University of Naples, Italy
 Elpidio Romano, Lecturer, University of Naples, Italy

The presentation concerns the definition of a virtual manufacturing business model. This general model will be able to reproduce the different real behavior of the firm and its external relationships, to define a supply chain networks to support decisions in the management productive environments.

025-0167 The Complexity and the User: The Human Centered Design approach as a paradigm for this integration

Carlos Eduardo Barateiro, Student, Universidade Federal Fluminense, Brazil
 Jose Rodrigues Farias Filho, Assistant Professor, Universidade Federal Fluminense, Brazil
 Luiz Antonio Campagnac, Associate Professor, Universidade Federal Fluminense, Brazil

The article discusses the concept called Human Centered Design of project implementation focused on the human being who will operate or use the product of the project. It is important to the decision making especially the fact that the procedures cannot anticipate every situation that the worker is submitted.

025-0980 Toward a methodology of technological roadmapping for SMEs: an action research in Area Science Park

Alberto De Toni, Professor, University Of Udine, Italy
 Cinzia Battistella, Lecturer, University Of Udine, Italy
 Roberto Pillon, Student, Area Science Park and University of Udine, Italy

Innovation requires an interdisciplinary approach, knowledge processing, diversity and openness to collaboration that in general SMEs struggle to access. The paper contributes to foresight and technology management, proposing a methodology to implement technological roadmapping for SMEs. The research strategy is an action research in a S&T park, Area Science Park.

315	Monday, 08:00 AM - 09:30 AM, Los Angeles (Floor 5)	<i>Track:</i> Production Planning and Scheduling
	<i>Session:</i> Planning and Scheduling in Complex Systems II	
	<i>Chair(s):</i> Alexander Meckelnborg	

- 025-1301** Integrative Factory Design by efficient interaction models
 Achim Kampker, Associate Professor, WZL at RWTH Aachen University, Germany
 Peter Burggräf, Instructor, WZL at RWTH Aachen University, Germany
 Tobias Welter, Lecturer, WZL at RWTH Aachen University, Germany
 Alexander Meckelnborg, Student, WZL at RWTH Aachen University, Germany

Factory design projects comprehending the planning of the production system and the industrial building face continuously increasing complexity. Common factory design approaches cannot cope with the rising coordination costs among the planning participants and disciplines. Therefore, efficient interaction models for an integrative factory design will be presented in this paper.

- 025-0095** Quantitative approach for evaluation of company's changeability based on feedback data
 Till Potente, Assistant Professor, Aachen University, Germany
 Günther Schuh, Professor, Aachen University, Germany
 Sascha Fuchs, Assistant Professor, Aachen University, Germany
 Christina Thomas, Assistant Professor, Aachen University, Germany

Manufacturing companies have to cope with high market dynamics. This quantitative approach for evaluation of company's changeability is based on the comparison of already realized output and related effort. By using feedback data, a software tool visualizes these both sides and enhances user to evaluated current changeability of the company.

- 025-1333** A Lagrangian Relaxation and Dual-Ascent Based Heuristic for the Capacitated Joint Replenishment Problem
 Powell Robinson, Professor, University Of Houston, United States
 Li-Lian Gao, Associate Professor, Hofstra University, United States

We consider a joint replenishment problem in which a family of products shares a limited replenishment resource. Demand for each item is deterministic but can vary over time. We will present the computational results for the problem with a Lagrangian relaxation and dual-ascent based Heuristic.

316	Monday, 08:00 AM - 09:30 AM, Northwestern (Floor 6)	<i>Track:</i> Supply Management
	<i>Session:</i> Supply Chain Focused Sourcing Strategies	
	<i>Chair(s):</i> WC Benton	

- 025-0495** Control, Coordination, and Complex Global Outsourcing Services
 WC Benton, Professor, Ohio State University, United States
 Sean Handley, Assistant Professor, Rutgers University, United States

Prior research suggests outsourcing organizations struggle to accurately estimate the costs associated with managing inter-organizational relationships. Using dyadic data on 102 outsourcing relationships, we investigate how dimensions of task complexity and the offshore characteristics of the outsourcing service influence the degree of control and coordination costs incurred by customer organizations.

- 025-0493** Managing the Supply of Cores used in Remanufacturing
 WC Benton, Professor, Ohio State University, United States
 Toyin Clotley, Assistant Professor, Iowa State University, United States

An important problem faced by a remanufacturer is ensuring a sufficient supply of cores. The accurate forecasting of product returns can be used for managing the sourcing of cores. We develop a generalized approach to forecasting product returns. Comparisons with existing methods show significant advantages of our approach.

- 025-0533** The Influence of Power in the Medical Equipment Supply Chain
 Jurriaan de Jong, Student, Ohio State University, United States
 WC Benton, Professor, Ohio State University, United States

We empirically analyze the effect of supply chain power on the performance of members of the medical equipment supply chain. In particular we study the moderating role of a middleman, a Group Purchasing Organization, on the effect of supply chain power on the relationship between OEMs and health organizations.

- 025-0648** Market analysis and transportation procurement for the World Food Programme in Ethiopia
 Jarrod Goentzel, Lecturer, Massachusetts Institute Of Technology, United States
 Marie-Eve Rancourt, Student, Hec Montreal, Canada

In transporting food aid, the World Food Programme (WFP) contracts with third-party transporters. Historical contracts are analyzed using statistical models to characterize Ethiopian transportation markets. We show how WFP and other shippers can use the results to improve transportation procurement processes and overall supply chain performance.

317	Monday, 08:00 AM - 09:30 AM, Ballroom C (Floor 5)	<i>Track:</i> Healthcare Operations
	<i>Session:</i> Healthcare Empirical Studies	
	<i>Chair(s):</i> Sriram Venkataraman	

- 025-0379** Supply Chain Integrative practices in Indian firms and its impact on firm's performance
 Sourabh Bhattacharya, Associate Professor, IMT, India
 Nikhat Afshan, Student, University Of Memphis, United States

This study explores the supply chain integrative practices in healthcare industries in India. Since most of the studies have been done in US context and show that integration improves performance, it becomes worthwhile to investigate whether the same practices are prevalent in developing countries and how does it affect performance?

025-0909 The Impact of Learning-curve Heterogeneity and Workload on Orthopedic Procedure Times

Michael Lapré, Associate Professor, Vanderbilt University, United States
David Moore, Fellow, Stanford School of Medicine, United States

Prior studies of service times have investigated the impact of (1) individual, team, and organizational learning; (2) learning-curve heterogeneity; and (3) workload. However, evidence for each factor has been reported without controlling for the other factors. We study the combined impact of all three factors on orthopedic procedure times.

025-1796 Valuing Prearranged Paired Kidney Exchanges: A Stochastic Game Approach

Murat Kurt, Assistant Professor, University Of Buffalo, United States
Andrew Schaefer, Professor, University Of Pittsburg, United States
Utku Unver, Professor, Boston College, United States
Mark Roberts, Professor, University Of Pittsburg, United States

Paired kidney exchanges alleviate shortages in the supply of kidneys for transplantation. Considering transplant timing decisions in a PKE, we formulate the problem as a stochastic game and characterize the welfare maximizing equilibrium as an optimal solution to an MIP. Clinical implications are demonstrated using large-scale nationally representative data.

025-1379 An Empirical Examination of Scheduling Decisions in Peri-operative Services

Sriram Venkataraman, Student, Clemson University, United States
Lawrence Fredendall, Professor, Clemson University, United States
Kevin Taaffe, Associate Professor, Clemson University, United States
Nathan Huynh, Assistant Professor, University Of South Carolina, United States

We examine variability buffers in peri-operative system (POS) of a hospital using the Newsvendor Model and an econometric framework (Olivares et al., 2008). The implications of managers' actions based on their perceptions of the value of POS resources are explored using the structural and infrastructural elements (Hayes and Wheelwright, 1984).

318	Monday, 08:00 AM - 09:30 AM, Kansas City (Floor 5)	<i>Track:</i> Healthcare Operations
	<i>Session:</i> Healthcare Strategy and Policy	
	<i>Chair(s):</i> Rajesh Srivastava	

025-1720 Human Health and Sustainable Development in India: A State Level Analysis

Rudra Pradhan, Assistant Professor, Indian Institute Of Technology Kharagpur, India
Tapan Bagchi, Retired, Indian Institute Of Technology Kharagpur, India

Health is a crucial aspect of human capital—a critical ingredient that sustains economic development. Poor health also dilutes the utilization of the environment's bounties. This paper quantitatively gauges the nexus between government spending on health, health status, and economic growth for India, covering the 1980-2009 period that saw that country convincingly break away from its listless mode of economic growth. It finds that spending on health infrastructure has had substantial impact on health status as well as India's economic growth.

025-1439 A comparison of Internal and External GPOs in Healthcare

WC Benton, Professor, Ohio State University, United States
Rajesh Srivastava, Professor, Florida Gulf Coast University, United States

Group Purchasing Organizations (GPOs) provide an important role in the interface between the healthcare organization and its suppliers. External GPOs function as a third-party provider or the healthcare organization may develop its own internal GPO. A comparison for effectiveness between internal and an external GPOs is made.

025-1314 Productivity and Health impacts on citrus harvest using platforms

João Camarotto, Professor, Universidade Federal De São Carlos, Brazil
Simone Alves, Student, Universidade Federal De São Carlos, Brazil

Case study using Ergonomic Work Analysis method, focusing in citrus harvest activity in Brazilian orchards. Under productivity and physical expenditure perspective, a comparison between manual and semi-mechanized methods showed the latter to present greater productivity and lesser injury rates. The analysis also provided means to proposition of improvements.

319	Monday, 08:00 AM - 09:30 AM, Wisconsin (WI) (Floor 6)	<i>Track:</i> Retail Operations
	<i>Session:</i> Retail Operations II	
	<i>Chair(s):</i> Ramesh Sharda	

025-0448 Dynamic Retail Location Model with Market Learning

Shahzad Bhatti, Student, University Of Illinois Urbana-Champaign, United States
Ho-Yin Mak, Assistant Professor, Hong Kong University Of Science & Tech, Hong Kong
Michael Lim, Assistant Professor, University Of Illinois Urbana-Champaign, United States

We study the optimal store location decisions for a firm entering a new market where the market adoption rate is learned over time. A trade-off between "active learning" and "deferred commitment" is captured by a two-stage model where the market learning time is endogenously determined by firm's first stage action.

025-1359 Consumer purchase intent of the Greater ABC region in São Paulo to the children's day

Joao Santos, Student, Universidade Metodista De Sao Paulo, Brazil
Wanderlei De Paulo, Professor, Universidade Metodista De Sao Paulo, Brazil

Survey of 501 respondents related retail operations and consumer purchasing decisions for the children's day. Importance of logistics to supply the markets of the Greater ABC region in São Paulo, average spending of retail and care in maintaining various products.

025-0145 Setting Efficient Inventory Targets after New Marketing Efforts
Yun Shin Lee, Student, University Of Cambridge, United Kingdom

When new marketing efforts are made, there is uncertainty about the persistence of those efforts on product demands. We consider the problem of setting inventory targets in the face of the uncertainty and develop a new robust approach that explicitly acknowledges the uncertainty by extending the Bayesian model averaging method.

025-0044 A Comprehensive System Dynamics Model for Retail Operations: RFID Adoption in the Retail Sector
Ramesh Sharda, Professor, Oklahoma State University, United States
Narges Kasiri, Assistant Professor, SUNY Oneonta, United States

This study develops a comprehensive system dynamics model for retail operations that includes the operations in marketing, merchandising, and store execution of supply chain (SC) management. The simulation is built based on a Delphi study and shows that benefits in marketing and merchandising operations are as significant as those in SC.

320	Monday, 08:00 AM - 09:30 AM, River North (Floor 2) <i>Session:</i> Innovation in Latin America <i>Chair(s):</i> Afonso Fleury	<i>Track:</i> OM in Latin America and the Caribbean
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025-1553 Mobility and Flexibility: The use of Mobile Technologies
Clovis Galdino, Student, Universidade Metodista De Sao Paulo, Brazil
Washington Luiz Soares, Student, Unisanta, Brazil
Amarildo Nogueira, Student, Unisantos, Brazil
Getulio Akabane, Student, Unia- Anhanguera, Brazil

The wireless network is advancement in the way in which the data transmission is done between computers and electronic equipments in order to support corporate managements. The present research collects data with structured questionnaires through industries and service companies into the industrial in Brazil regarding mobile technologies.

025-1065 The firm's operational capability and innovation: Comparative studies of innovative firms from Brazil
Paulo Zawislak, Associate Professor, Universidade Federal Do Rio Grande Do Sul, Brazil
Caroline Prates, Student, Universidade Federal Do Rio Grande Do Sul, Brazil
Lazaro Sumba, Student, Universidade Federal Do Rio Grande Do Sul, Brazil
Antonio Padula, Associate Professor, Universidade Federal Do Rio Grande Do Sul, Brazil

In emergent economies, firm's innovation is often a survival issue. This research is focused on the operational capability concept and it is intended to explain, in a comprehensive way, how this capability matters and supports innovation. This paper analyzes firms, which working under standard technology, innovate and export.

025-1288 Internationalization and its consequences on the operations management in an appliance company
Kleber Milaneze, Assistant Professor, Faculdades Integradas de Bauru, Brazil
Alessandra Rachid, Associate Professor, Federal University of São Carlos, Brazil

The text analyzes the internationalization of a home appliance company located in Brazil and its consequences on the operations management. The research involved interviews with a director and managers. It permitted to understand which activities won or lost autonomy and which operations management methods were required by the acquiring company.

025-1262 Brazilian multinationals' approaches to innovation
Afonso Fleury, Professor, Universidade De Sao Paulo, Brazil
Maria Tereza Fleury, Professor, Fundacao Getulio Vargas, Brazil

Brazilian firms internationalize successfully and innovations play an important role. Six types of approach to innovation were identified: commodity innovation, sustainable innovation, product innovation, business model innovation, base of pyramid innovation and reverse innovation. Theoretical framework was competence-based management. Data came from case studies and two surveys, 2006 and 2011.

321	Monday, 08:00 AM - 09:30 AM, Cook (Floor 3) <i>Session:</i> Supply Chain Management in China <i>Chair(s):</i> Houcai Shen	<i>Track:</i> OM in China/East Asia
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025-0159 Pursuing Logistics Social Responsibility in China: Exploring the Moderating Effects from Ownership
Zhaowei Miao, Professor, Xiamen University, China
Shun Cai, Associate Professor, Xiamen University, China

We seek to understand how external and internal drivers influence Logistics Social Responsibility adoption for Chinese firms. Moreover, we identify enterprise ownership as a potential moderator and explore how ownership moderates the impacts of various pressures/drivers on LSR. Finally we find the empirical results support most of our hypotheses.

025-1280 Time of Ordering, Payment and their Impact on Supply Chain Management
Weili Xue, Instructor, Nanjing University, China
Houcai Shen, Professor, Nanjing University, China

Based on Suning Appliance's story, we study time of Ordering, Payment and their Impact on the seasonal product Supply Chain Management. We will analyze retailer's ordering in advance or in the beginning of selling season, the payment time in advance or in the beginning of selling season.

025-1340 Design of Supply Chain Contracts with considering hyperbolic discounting and delay-speedup asymmetry of Payment

Juan Li, Associate Professor, Nanjing University, China
 Houcai Shen, Professor, Nanjing University, China
 Libin Li, Student, Nanjing University, China

This paper deals with a two-echelon supply chain in order to study the behavioral deviation caused by the payment timing based on hyperbolic discounting. The supplier is assumed a rational decision. The retailer is naive and uses hyperbolic discounting and delay-speedup asymmetry attitude to deal with payment in different time.

025-1224 Information Visibility and its Impact in a Supply Chain

Jianghua Wu, Associate Professor, Renmin University Of China, China

We study the impact of information sharing across decentralized retailers in a supply chain. The manufacturer supplies similar products to multiple retailers and each retailer serves its independent end market. We derive the equilibrium strategy for retailers to share demand information.

025-1480 Antecedents and Outcomes of Modularization (MD) in the Chinese Automotive Parts Industry

Steven Kramer, Associate Professor, Nova Southeastern University, United States
 Yunshan Lian, Student, Nova Southeastern University, United States

We develop a conceptual model relating antecedents and outcomes of modularization (MD) in the Chinese auto industry from the perspective of the first-tier (module) supplier. We are interested in analyzing the impact of three key factors with respect to firm performance.

322	Monday, 08:00 AM - 09:30 AM, Ballroom G (Floor 5)	<i>Track:</i> Supply Chain Risk
	<i>Session:</i> Empirical Studies in Supply Chain Risk Management	
	<i>Chair(s):</i> Richard Monroe	

025-0138 The development of a Supply Chain Risk Management (SCRM) implementation model

Wolfgang Kersten, Professor, Institute of Business Logistics and General Management, Germany
 Meike Schroeder, Student, Institute of Business Logistics and General Management, Germany
 Henning Skirde, Student, Institute of Business Logistics and General Management, Germany
 Max Feser, Student, Institute of Business Logistics and General Management, Germany

The aim of this study is to highlight factors which influence the implementation of SCRM. A literature review illustrates a research gap regarding SCRM implementation models. Factors have been identified in existing SCRM approaches and subsequently classified for an initial structural equation model. The next step includes the validation.

025-0513 Impact of ERP Implementation Process on Decreasing Risk in Supply Chain

Hossein Rikhtehgar Berenji, Student, Sharif University Of Technology, Iran (Islamic Republic of)
 Mahdi Abbasi, Reader, Azad Islamic University - Toyserkan Branch, Iran (Islamic Republic of)

In recent years, the ERP implementation has different results in companies because of different contents and business elements. In this research we discuss this impact on Supply Chain Risks. As the kind of implementation is important, we develop models in different phases to evaluate the situation.

025-0696 Measuring warning and recovery capabilities in SCRM: Construct development and measurement validation

Sri Sridharan, Professor, Clemson University, United States
 Janis Miller, Professor, Clemson University, United States
 Jason Riley, Student, Clemson University, United States

We develop psychometrically valid and reliable scales for warning and risk management capabilities. We then empirically investigate the antecedent competencies that enable these risk management capabilities to determine if and how warning and recovery capabilities affect the firm's performance.

025-0735 Supply Chain Risk Management: A Review of the Empirical Research

Richard Monroe, Associate Professor, East Carolina University, United States

One research gap identified by Sodhi, Son and Tang (2011) on the topic of supply chain risk management (SCRM) is the lack of empirical research. This paper will review existing empirical research about SCRM. Articles utilizing structural equation modeling (SEM) will be identified, reviewed and compared with other empirical articles.

025-0829 Propagation of amplified disruptions in supply chains: Conceptual Perspective and Practical Implications

Artur Swierczek, Associate Professor, University of Economics, Poland

The paper seeks to develop a conceptual framework for analyzing propagated and amplified disruptions in contemporary supply chains and provides findings of a cross-sector empirical study conducted among practitioners dealing with risk effects in their organizations.

323	Monday, 08:00 AM - 09:30 AM, Miami (Floor 5)	<i>Track:</i> OM in China/East Asia
	<i>Session:</i> Supply Chain Risk Management	
	<i>Chair(s):</i> Biying Shou	

025-0717 Why Does Venture Capital Performance Persist Over Time? Evidence from a Dynamic Simulation

Richard Smith, Professor, University Of California Riverside, United States
 David Porter, Professor, Chapman University, United States
 Long Gao, Assistant Professor, University Of California Riverside, United States

To better understand the evolution of the VC market and to assess the roles of luck and skill, we create an agent-based model in which the sorting institution is a two-sided matching process. Our approach to modeling is dynamic in that the preferred strategies employed by agents can evolve over time.

025-1202 Investment and Pricing with Spectrum Uncertainty

Lingjie Duan, Student, The Chinese University Of Hong Kong, Hong Kong
 Jianwei Huang, , The Chinese University Of Hong Kong, Hong Kong
 Biying Shou, Assistant Professor, City University Of Hong Kong, Hong Kong

We study the optimal investment and pricing decisions of cognitive mobile virtual network operators who faces spectrum supply uncertainty. We model and analyze the interactions between the operators and unlicensed wireless users as a Stackelberg game. We derive the network equilibrium and show several interesting properties of it.

025-1205 Dynamic Pricing in a Competitive Supply Chain
Wei-yu Chiang, Associate Professor, City University Of Hong Kong, Hong Kong

We extend the conventional analysis of one-shot price interaction in a supply chain to a dynamic setting, where a manufacturer distributes a product through a retailer to an exhaustible population of consumers. Intriguingly, our result reveals that both supply-chain entities are better off when they behave myopically.

025-1806 The Impact of Minimum Reservation Profit on Buy-Back Contract: An Experimental Study
Bin Shen, Student, Hong Kong Polytechnic Univ, China
Tsan-Ming Choi, Associate Professor, The Hong Kong Polytechnic University, Hong Kong
Pui-Sze Chow, Student, The Hong Kong Polytechnic University, Hong Kong
Yulan Wang, Assistant Professor, Hong Kong Polytechnic Univ, Hong Kong

In the classical newsvendor model, a retailer makes her ordering decision to maximize her expected profit, however, in a real business setting, her decision may subject to her Minimum Reservation Profit (MRP) constraint. In our behavior experiment, we study the impact of MRP on channel efficiency and supplier's behavior.

324	Monday, 08:00 AM - 09:30 AM, Minnesota (MN) (Floor 6) <i>Track:</i> Inventory Management
	<i>Session:</i> Issues in Inventory Management
	<i>Chair(s):</i> Shouqiang Wang

025-1351 Order Quantity under Heavy-Tailed Demand
Valérie Chavez-Demoulin, Assistant Professor, Universite De Lausanne, Switzerland
Isik Bicer, Student, Université de Lausanne, Switzerland
Christophe Tasserit, Instructor, Université de Lausanne, Switzerland
Stefan Wager, Student, Stanford University, United States
Suzanne de Treville, Professor, Université de Lausanne, Switzerland

The tail weight of a demand distribution has implications for the optimal order quantity. Assumption of a normal distribution leads to over ordering for a lower critical fractile, and under ordering for a critical fractile close to 1. We present analytical tools that incorporate tail weight into order quantity calculation.

025-1248 Managing expiration dates for perishable inventory
Vicky Salin, Professor, Texas A&M University College Station, United States
Gary Gaukler, Assistant Professor, Texas A&M University College Station, United States
Michael Ketzenberg, Associate Professor, Texas A&M University College Station, United States

We address the management of a random lifetime perishable product under periodic review. In addition to the timing and quantity of an order, a firm must decide a product expiration date. It is possible to sell product that is already perished and to discard product that remains good

025-0942 Lot Sizing with Learning and Forgetting in Setups: Computational Results and Insights
Sunantha Teyarachakul, Assistant Professor, Mahidol University, Thailand
Suresh Chand, Professor, Purdue University, United States
Michal Tzur, Professor, Tel Aviv University, Israel

This paper considers the dynamic lot sizing problem when there is learning and forgetting in setups. Learning in setups takes place with repetition when additional setups are made and forgetting takes place when there is a break between two setups. We allow the amount forgotten over a break to depend both on the length of the break and the amount of learning at the beginning of the break. The amount of forgetting could be small over the short initial interval of interruption. We present some decision/forecast horizon results and managerial insights based on computational results. We found that the characteristics of worker forgetting influence the setup frequency. For instance, the presence of forgetting characterized by a slow-forgetting S-shaped function leads to more frequent setups. Based on our computational experiments and analytical insights, the problems with a slow-forgetting S-shaped function are harder to solve and consequently provide longer forecast horizons.

025-0452 Does Private Information about Inventory Matter?
Shouqiang Wang, Assistant Professor, Clemson University, United States
Alexandre Belloni, Assistant Professor, Duke University Durham, United States
Giuseppe Lopomo, Professor, Duke University Durham, United States

We study multilateral private information about inventory levels on performance of two-echelon supply chains. When the retailer possesses bargaining power, the inventory policy coincides with the centralized one. When the supplier possesses bargaining power, the optimal inventory policy takes a simple ranking-allocation rule, whose consequence includes reverse ranking and overshooting.

325	Monday, 08:00 AM - 09:30 AM, Indiana (Floor 6) <i>Track:</i> Vendor and Supply Contracts
	<i>Session:</i> Supply Contracts and E-tailing
	<i>Chair(s):</i> Dennis Yu

025-0600 Price Uncertainty and Risk-Averse Procurement: Integrating Contracts and Open Market Alternatives
Shlomo Levental, Professor, Michigan State University, United States
Ram Narasimhan, Professor, Michigan State University, United States
Santosh Mahapatra, Assistant Professor, Clarkson University, United States

We evaluate the implications of concurrent utilization of "contracts" and "open market" arrangements by a risk averse buyer in continuous procuring of a standardized product. The contract price is deterministic and the market price is stochastic. Models are developed to determine the optimal pattern of procurement from the two arrangements.

025-0902 Impact of Supply Chain Power Structure on Drop Shipping Option for an E-tailer

Taesu Cheong, IEOR Department, Norfolk Southern Corporation, United States

Daewon Sun, Assistant Professor, University Of Notre Dame, United States

Dennis Yu, Assistant Professor, Clarkson University, United States

We investigate the impact of drop shipping option on competition and coordination in a supply chain with conventional brick-and-mortar retail channel and e-tailing channel. We answer the questions such as when the e-tailer can benefit from drop shipping and how drop shipping strategy affects overall supply chain performance.

025-1124 Sourcing Allocation Policies for Contract Manufacturing under Global Network Uncertainties

Chieh Lee, Student, Washington State University Pullman, United States

Charles Munson, Associate Professor, Washington State University Pullman, United States

We consider a firm that determines its capacity allocation strategy while facing uncertain demand, exchange rate risks, and other risks. The firm may source from contract manufacturers, offshore branches, and/or in-house production. We examine the use of quantity flexibility contracts with the contract manufacturers. We analyze various levels of diversification.

025-0548 Designing Backup Supply Contracts to Cope with Supply Disruption Risks

Amy Zeng, Associate Professor, Worcester Polytechnic Institute, United States

Yu Xia, Associate Professor, Northeastern University, United States

We consider a situation where a buyer has two sources of supply - a primary supplier and a backup supplier. A revenue-sharing contract between the buyer and the backup supplier is designed by game theory to see how to utilize the backup supply when the primary supplier experiences disruptions.

327	Monday, 10:00 AM - 11:30 AM, Lincolnshire II (Floor 6)	<i>Track:</i> Empirical Research in OM
	<i>Session:</i> Topics in Empirical Research	
	<i>Chair(s):</i> Rolf Erdmann	

025-1133 The Qualitative Approach between years 2007 to 2011 in Production Management Research in Brazil

Rolf Erdmann, Professor, Universidade Federal De Santa Catarina, Brazil
 Darlan Roman, Student, UFSC, Brazil
 Jamur Marchi, Student, UFSC/UNIPAMPA, Brazil

In this article, we discuss the application of qualitative research in production management in Brazil. For this, we selected 501 articles of the main Brazilian scientific journals. We analyzed the qualitative methods used and topics studied. The results show the methodological features of studies in management of production in Brazil.

025-0409 The Operations Strategy and the Environmental Dimension: A Case Study in the Brazilian Automotive Industry

Guilherme Heinz, Professor, Centro Universitario Da Fei, Brazil
 Gabriela Sul, Professor, Centro Universitario Da Fei, Brazil

The objective of this multiple case study, which was carried out in three car manufacturers of the Brazilian automotive industry, is to evaluate how firms consider in their operations strategy the environmental dimension that, due to the currently sustainability matters, is enhancing its importance for the society, government and firms.

025-0638 Project portfolio management: An analysis of management practices

Marly Carvalho, Associate Professor, Polytechnic School Of Sao Paulo, Brazil
 Daniela Marzagão, Student, University Of São Paulo, Brazil
 Ana Paula Lopes, Student, University Of São Paulo, Brazil

Project portfolio management has been a relevant subject of academic research and organizational management. This article aims to analyze the management practices of project portfolio management. For this, was performed a survey, whose results were analyzed using a statistical technique of multivariate data known as clustering.

328	Monday, 10:00 AM - 11:30 AM, Ohio State (Floor 6)	<i>Track:</i> Humanitarian Operations and Crisis Management
	<i>Session:</i> Crisis Management: Some Perspectives	
	<i>Chair(s):</i> Gary Graham	

025-0428 Hospital operations management in disasters: A review of literature

Mohammadmahdi Moqri, Student, University Of Massachusetts Boston, United States
 Davood Golmohammadi, Assistant Professor, University Of Massachusetts Boston, United States

This paper provides a review of the research on hospital operations management in disasters. We classify the literature into four categories: hospital capacity management, resource management, disaster plans, and disaster preparedness. In each category, we discuss the studies' contributions and methodologies, and suggest several future research directions

025-0917 The catastrophe and control model of emergency logistics capacity system

Jun SUN, Student, Nanjing University of Aeronautics and Astronautics, China

Based on catastrophe theory, the paper built a swallowtail catastrophe model of emergency logistics capacity system (ELCS). The balance surface, singularities set are ascertained by potential function, the singularities stability are discussed, based on which, the nonlinear programming model in order to control and improve emergency logistics capability is established.

025-1484 A new multi-objective scenario-based robust stochastic programming for recovery planning

Navid Sahebjamnia, Student, University of Tehran, Iran (Islamic Republic of)
 Ali Torabi, Associate Professor, University of Tehran, Iran (Islamic Republic of)
 Nima Salehi, Student, University of Tehran, Iran (Islamic Republic of)
 Afshin Mansouri, Lecturer, Brunel University, United Kingdom

A multi-objective robust stochastic recovery planning model is developed to maximize total value of recovery capability and completeness while minimizing total recovery cost. The weighted augmented e-constraint method is applied to generate efficient solutions based on disaster scenarios under uncertainty. Applicability of the model is demonstrated using a numerical example.

025-1245 ECHO'S Role in Humanitarian Arian Air Transport: An Analytic Hierarchy Process (AHP) Approach

Stephanie Berchtold, Student, ECHO, Belgium
 Mohammad Moshdari, Student, University Of Lugano, Switzerland
 Paulo Goncalves, Associate Professor, University Of Lugano, Switzerland

ECHO is currently assessing its future involvement in the management of humanitarian air transport. A number of factors (e.g., number of disasters, efficient use of funds, visibility, regional instability) influence this decision. We use the Analytic Hierarchy Process (AHP) to produce quantitative comparative analysis that supports the decision process.

329	Monday, 10:00 AM - 11:30 AM, Purdue (Floor 6)	<i>Track:</i> Marketing and OM Interface
	<i>Session:</i> Pricing and Channel Design	
	<i>Chair(s):</i> Hisashi Kurata	

025-0294 Relation between the launch of new durable goods and the customers' purchase of after-sales service

Hisashi Kurata, Associate Professor, University Of Tsukuba, Japan

The after-sales service is regarded as a strategic tool for modern manufacturing. The relation between the launch of new products with a short lifespan and the purchase of extended after-sales service is analyzed by a diffusion model. We then discuss managerial insights, such as the timing of a product release.

025-1589 Return Policies and Information Provision in a Supply Chain

Eylem Koca, Assistant Professor, Fairleigh Dickinson University, United States

We consider the consumer return policy and information provision decisions in a two-tier supply chain for a single product where the retailer decides on the policy for consumer returns and the manufacturer decides on the information provision. We compare the centralized and decentralized settings and investigate the possibilities for coordination.

025-1807 Integrated pricing and MTO supply chain network design under demand uncertainty

Cheng-Chang Lin, Professor, National Cheng Kung University, Taiwan, Republic of China

Yi-Chen Wu, Student, National Cheng Kung University, Taiwan, Republic of China

A stochastic model determines product prices and designs an integrated supply chain operations network to maximize the total expected profit. The results showed that when the demand distribution is widened, the manufacturer will stocks sufficient differentiated components even with fewer modules in stock and simultaneously lower the product prices.

331	Monday, 10:00 AM - 11:30 AM, Dupage (Floor 3)	<i>Track:</i> Scheduling and Logistics
	<i>Session:</i> Logistics III	
	<i>Chair(s):</i> Tomás Harrington	

025-0336 Knowledge Management in Materials Management-Logistics and its importance to the production sector

Osmildo Santos, Professor, Universidade Nove De Julho, Brazil

Pedro Luiz Neto, Professor, Universidade Paulista - Unip, Brazil

Oduvaldo Vendrametto, Professor, Universidade Paulista - Unip, Brazil

Marcelo Okano, Professor, Federal Institute of Sao Paulo / faculty of technology of Barueri, Brazil

This paper identifies the principles of Knowledge Management, Competence and Leadership can be known and managed, to make decisions, aimed at a professional effectiveness in implementing the activities of the Materials Management- Logistics, evaluating its importance to the sector of production and the benefits of these applications.

025-0603 An Approach to Evaluate the Degree of "Stress of Tankage" in Oil Refinery Tank Farms

Daniel Lacerda, Professor, UNISINOS, Brazil

Luis Rodrigues, Professor, Universidade do Vale do Rio dos Sinos, Brazil

Adriana Ito, AB-RE/TR/TE , PETROBRAS, Brazil

Mario Jorge Lima, AB-RE/TR/TE, PETROBRAS, Brazil

Luis Felipe Camargo, Student, UNISINOS, Brazil

Dieter Goldmeyer,, Student, UNISINOS, Brazil

Tank farms in oil industry can experiment moments where there is not space to load products, highly stressed, as well as moments of idleness, low stressed, making it difficult to define its appropriate size. This paper presents a heuristic to define the degree of "stress of tankage" in oil refineries.

025-0707 Last Mile Logistics Evaluation - Customer, Industrial and Institutional Perspectives

Tomás Harrington, Associate Professor, University of Cambridge, United Kingdom

In the UK, 30% of 'last mile' deliveries fail first time. This research focuses on the development of effective tools for Last Mile Logistics evaluation from the perspective of all stakeholders involved (i.e. the final customer, parcel delivery organizations and the public sector) to enable improved service provision.

332	Monday, 10:00 AM - 11:30 AM, Ballroom A (Floor 5)	<i>Track:</i> Sustainable Operations
	<i>Session:</i> Eco & Carbon Labels and Environmental Reporting	
	<i>Chair(s):</i> Pavel Castka	

025-0968 Stringency, governance, media coverage and diffusion of environmental and social labeling schemes

Pavel Castka, Associate Professor, University Of Canterbury, New Zealand

Charles Corbett, Professor, University Of California Los Angeles, United States

In this paper we examine whether adoption of labeling schemes depends on the stringency of its requirements, its governance practices, and the way it is portrayed in the media. Using a sample of 40 labeling schemes, we combine three data sets to answer these questions.

025-1000 Using Life Cycle Assessment to Evaluate Ecolabel Claims

Holly Lahd, Student, University Of Minnesota, United States

Rylie Olson, Student, University Of Minnesota, United States

Timothy Smith, Associate Professor, University Of Minnesota, United States

As green procurement strategies spread, the need for qualified ecolabeling claims intensifies. This paper introduces a method toward 1) a scalable hot-spot analysis of product categories' largest environmental impacts, and 2) an assessment of an ecolabels' ability to reflect hot-spot reductions. Implications on food/beverage operations and procurement will be presented.

025-1131 Voluntary versus Mandatory Environmental Reporting: Implications of Strategic Investors and Customer Behavior

Basak Kalkanci, Student, Massachusetts Institute Of Technology, United States

Erjie Ang, Student, Stanford University, United States

Erica Plambeck, Professor, Stanford University, United States

In an analytic model, we find that the opportunity to voluntarily disclose emissions can spur strictly more learning about emissions and associated reduction in emissions than a requirement for mandatory disclosure. In a related survey, we find that voluntary disclosure of emissions boosts consumer demand, while mandatory disclosure does not.

025-1462 Product Carbon Labels in a Two-Stage Supply Chain

Edgar Blanco, Professor, Massachusetts Institute Of Technology, United States

Yossi Sheffi, Professor, Massachusetts Institute Of Technology, United States

Anthony Craig, Student, Massachusetts Institute Of Technology, United States

In product carbon labels, unlike many eco-labels, all firms in the supply chain can influence the label. We explore the implications for firms in a two-stage supply chain under a voluntary, continuous labeling scheme with third party certification in a duopoly vertical differentiation model.

333	Monday, 10:00 AM - 11:30 AM, Denver (Floor 5) <i>Session:</i> International Perspectives in Sustainable Operations <i>Chair(s):</i> Marcus Schroeter	<i>Track:</i> Sustainable Operations
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025-0667 Factors for implementing end-of-life product recycling operations in Chinese manufacturing sector

Muhammad Abdulrahman, Assistant Professor, University Of Nottingham, China
Angus Hooke, Professor, Nottingham University Business School China, China
Nachiappan Subramanian, Associate Professor, Nottingham University Business School, China

This study aims to prioritize various end-of-life product recycling factors in reverse supply chains from firms' perspective in Chinese manufacturing sector. Using case study method and analytic hierarchy process this study prioritizes factors in five manufacturing companies. Comparative analysis is carried out to understand influencing factors in the five companies.

025-1014 Brazilian scenario for the recycling industry

Henrique Chagas, Student, Polytechnic School - Production Engineering Department, Brazil
João Amato Neto, Professor, Polytechnic School Of Sao Paulo, Brazil

This paper presents the current scenario of the recyclable materials industry highlighting the recent legal context, social features, market agents, products and services offered. Recycling is a key step in a responsible operation that does not compromise the human relations and environment.

025-1211 Overcoming barriers to implementing recycling solutions: empirical analyses in the German manufacturing sector

Katharina Mattes, Researcher, Fraunhofer Institute for Systems and Inn, Germany
Angela Jäger, Researcher, Fraunhofer Institute for Systems and Inn, Germany
Marcus Schröter, Researcher, Fraunhofer Institute for Systems and Inn, Germany

We use data from 1,484 German companies to investigate the determinants for the introduction of recycling to reduce raw materials consumption. Our findings suggest that firms which are using management tools such as environmental performance measurement systems or life cycle costing evaluation methods are more likely to invest in recycling.

336	Monday, 10:00 AM - 11:30 AM, Ballroom B (Floor 5) <i>Session:</i> Transportation and Warehouse Management <i>Chair(s):</i> James Kroes	<i>Track:</i> Supply Chain Management
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025-0356 Freight Origin-Destination Estimation Using Bayesian Networks Based on Multiple Data Sources

Roelof Kuik, Associate Professor, Erasmus University Rotterdam, Netherlands
Yinyi Ma, Student, Erasmus University Rotterdam, Netherlands
Henk van Zuylen, Professor, Delft University Of Techology, Netherlands

Freight origin-destination (OD) estimation becomes increasingly important. Traditional general traffic OD estimation methods based on loop detectors have the under-specification problem. This paper investigates a Bayesian Networks approach for estimating freight OD-matrices by Markov-chain-Monte-Carlo methods, thereby mitigating under-determinacy by exploiting proportionally-contributing multiple data sources, such as camera, Bluetooth and Weigh-in-Motion.

025-1430 The Impact of Short Sea Shipping on Logistics in Rhode Island

James Kroes, Assistant Professor, Boise State University, United States
Paul Mangiameli, Emeritus Professor, University Of Rhode Island, United States
Yuwen Chen, Assistant Professor, University Of Rhode Island, United States

This study examines the potential benefits of using short sea shipping between U. S. east-coast ports and the port located in Rhode Island as a mechanism to reduce the highway congestion, energy usage, and the environmental impact associated with the freight delivery.

025-1519 The influence of organizational capability development on third party logistics performance

Chris Hemstrom, Student, Macquarie Graduate School of Management, Australia
Norma Harrison, Professor, Macquarie Graduate School of Management, Australia

This research focuses on the third party logistics (3PL) sector, particularly factors thought to influence capability development and their potential effects on 3PL performance. Structural equation modeling is used to test direct and indirect relationships between 3PL learning processes, their absorptive capacity, integration capabilities and performance.

025-0166 Grow Without Profit - A Business Strategy Applied in the Brazilian Automation Market

Jose Rodrigues Farias Filho, Assistant Professor, Universidade Federal Fluminense, Brazil
Ricardo Bordeaux, Assistant Professor, Universidade Federal Fluminense, Brazil
Luiz Antonio Campagnac, Associate Professor, Universidade Federal Fluminense, Brazil
Carlos Eduardo Barateiro, Student, Universidade Federal Fluminense, Brazil

This article discusses how the development of operational strategy, focused on after-sale services, together with a corporate strategy of growing installed base, may be a decisive factor to achieve the main goal which is the profit, supported by the principles of corporate governance

337	Monday, 10:00 AM - 11:30 AM, Houston (Floor 5) <i>Session:</i> Supply Chain Innovation <i>Chair(s):</i> Soumen Ghosh	<i>Track:</i> Supply Chain Management
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025-0022 Diffusion of Innovation with the Task-Technology Fit Theory in Supply Chain Management Software Adoption

Qing Cao, Professor, Texas Tech University, United States

Vicky Gu, Student, Texas Tech University, United States
 Marc Schniederjans, Professor, University Of Nebraska Lincoln, United States

We develop a framework for research into the diffusion of innovations in organizations as it relates to software adoption in supply chain management based on Task-Technology Fit theory applied in Customer Relations Management software adoption. An empirical study of supply chain managers confirms the usability of the proposed framework.

025-1406 Speed of New Product Introduction: An Analysis from the Perspective of Supply Chain Integration

Ely Paiva, Associate Professor, Fundacao Getulio Vargas, Brazil
 Luciano Carvalho, Student, Fundacao Getulio Vargas, Brazil

This study proposes a conceptual model that explores supply chain integration as facilitator for new technologies development and speed of NPD. The relations will be analyzed using structural equation modeling. The sample is composed by 300 manufacturing plants located in 11 countries.

025-0642 Association between Supply Network Structure and Firm Innovation

Marcus Bellamy, Student, College of Management, United States
 Manpreet Hora, Assistant Professor, Georgia Institute Of Technology, United States
 Soumen Ghosh, Professor, College of Management, United States

Our paper investigates the association between supply network structure and firm innovation. Using social network analysis, we develop our hypotheses linking network properties at the firm level and innovation. We test our hypotheses using data from the electronics industry. We will present our preliminary results and their implications.

025-0469 The changes of the music supply chain value after the Internet and music digitization era

Alan Kuhar, Student, Eaesp - Fgv, Brazil

Music production has changed. Recording, pressing and distribution were made by record labels. With the Internet and technology development, record companies lost relevance once musicians can record and distribute their own music. Lower barriers of entry may have moved some value in the music supply chain to other members.

025-0903 Making Lemonade from Lemons - When Keeping an Unattractive Innovation Makes Sense

Christopher Fleming, Student, Michigan State University, United States
 Steve Melnyk, Professor, Michigan State University, United States

Why would a firm continue to use an innovation that is found to be economically disadvantageous? By drawing on corporate experiences with 3PL, we address this question by uncovering the hidden reasons - reasons linked to asset changes caused by the innovation. These reasons are incorporated into a revised framework.

338	Monday, 10:00 AM - 11:30 AM, Watertower (Floor 10)	<i>Track:</i> OM in China/East Asia
	<i>Session:</i> Transportation and Inventory: Models and Practices	
	<i>Chair(s):</i> Kok Choon TAN	

025-1818 Operations Management in Singapore Container Terminals

Kok Choon TAN, Associate Professor, National University Of Singapore, Singapore

In this paper, we describe some of the main operation challenges faced by the world's busiest container transshipment hub in Singapore and highlight the best practice operations management techniques used by the terminal operator to overcome these challenges.

025-1819 No-Right-Turn Policy in Bus Route Design in Singapore

Qizhang Liu, Senior Lecturer, National University Of Singapore, Singapore
 Chung-Piaw Teo, Professor, National University Of Singapore, Singapore
 Mark Goh, Associate Professor, National University Of Singapore, Singapore
 Liwei He, Student, National University Of Singapore, Singapore

This paper presents an MIP model to study the effect of no-right-turn policy in bus route design in Singapore. Experiments based on the public transport data from Land Transport Authority of Singapore show positive impact of reducing number of right turns on bus service level.

025-0986 Sourcing complexity factors on contractual relationship: Chinese suppliers' perspective

Muhammad Abdulrahman, Assistant Professor, University Of Nottingham, China
 Nachiappan Subramanian, Associate Professor, Nottingham University Business School, China
 Shams Rahman, Professor, School of Business IT and Logistics, Australia

Original equipment manufacturers' around the world are sourcing from suppliers in China to gain competitive advantage. They encounter various tangible and intangible process complexity factors which influences their contractual relationship. Case studies have been carried out with few Chinese suppliers to understand their views and to prioritize complexity factors.

339	Monday, 10:00 AM - 11:30 AM, Ballroom F (Floor 5)	<i>Track:</i> Product Innovation and Technology Management
	<i>Session:</i> Assorted Topics on Innovation	
	<i>Chair(s):</i> Guido Guizzi	

025-1433 A novel approach to design or improve a system

Teresa Murino, Assistant Professor, University of Naples Federico II, Italy
 Liberatina Santillo, Professor, University of Naples Federico II, Italy
 Mosè Gallo, Assistant Professor, University of Naples Federico II, Italy
 Giovanni Tullio, Manufacturing Manager Cooper Standard Automotive Italy SpA, Cooper Standard Automotive Italy SpA, Italy
 Pietro Mancuso, Process manager, Cooper Standard Automotive Italy, Italy

The aim of this paper is to present an innovative approach to design and/or improve a new or an existing system. This methodology is intended to melt in the most suitable way many tools and techniques already used in the industrial context but often used separately.

025-0570 To Enhance the Application of New Product on Trust-oriented Perspective

Chuanzhen Wu, Student, Xiamen University, China
Di Xu, Professor, Xiamen University, China

Nowadays, product life often ranges from one to two years and even shorter. We need to find an effective way to expand our new product market. Based on trust theories, computational experiments are made to prove that the increase of the successful user experience will be substantial helpful.

025-1019 Sealing System Development Through OpEx Approach

Roberto Revetria, Professor, University of Genoa, Italy
Elpidio Romano, Lecturer, University of Naples, Italy
Liberatina Santillo, Professor, University of Naples Federico II, Italy
Guido Guizzi, Assistant Professor, University of Naples, Italy
Crescenzo Iannicelli, Engineer, Whirlpool, Germany
Raffaele Di Micco, Engineer, Whirlpool, Italy

The purpose of this work is present the methodology of innovation and development through experimentation, applying an approach bringing to the Operational Excellence (OpEx). This is applied to a mechanical system present in several manufacturing applications (automotive, utensil machines, wind turbines, compressors, washing machine): the sealing system.

340	Monday, 10:00 AM - 11:30 AM, Los Angeles (Floor 5)	<i>Track:</i> Production Planning and Scheduling
	<i>Session:</i> Single-Machine Scheduling	
	<i>Chair(s):</i> Rajkanth Raju	

025-0407 Single-machine Scheduling with Periodic Maintenance and Preemptive and Non-preemptive jobs in Remanufacturing

Weida Chen, Professor, Southeast University, China
Biyu Liu, Student, Southeast University, China

This paper considers a single-machine scheduling problem with periodic maintenance and both preemptive and non-preemptive jobs in remanufacturing workshop. The objective is to minimize the make-span. A LPT-LS algorithm was proposed and its worst-case ratios were discussed in three cases in terms of the preemptive jobs' total processing time.

025-1268 Stochastic Single Machine Family Scheduling To Minimize the Number Of Risky Jobs

Gursel Suer, Professor, Ohio University, United States
Gokhan Egilmez, Student, Ohio University, United States

In this paper, a stochastic single machine family scheduling problem is studied. Jobs are classified as "tardy", "risky" and "early" based on the probability of tardiness. A stochastic non-linear mathematical model is developed and experimented with various configurations. The number risky jobs are reduced significantly in all configurations.

025-0960 A branch-and-bound algorithm for single machine scheduling problem to minimize completion time variance

Rajkanth Raju, Student, Indian Institute Of Technology Madras, India
Rajendran Chandrasekharan, Professor, Indian Institute Of Technology Madras, India

We propose a lower bound and an upper bound with respect to the completion time of an unscheduled job in all feasible positions. A lower bound is obtained by solving an assignment problem. We propose an efficient branch-and-bound algorithm to obtain an optimal sequence to minimize the CTV of jobs.

025-1338 Are the Commonly Used Objectives in Scheduling Economically Optimal?

Anurag Agarwal, Associate Professor, University Of South Florida, United States

Various objectives such as minimize the makespan, minimize the lateness, minimize the cost etc. are used when solving any scheduling problem. The question is which of these objectives are economically optimal? In this paper, we develop boundary conditions under which these objectives would be considered economically optimal.

341	Monday, 10:00 AM - 11:30 AM, Northwestern (Floor 6)	<i>Track:</i> Supply Management
	<i>Session:</i> Supply Management: Empirical Analysis	
	<i>Chair(s):</i> Amelia Carr	

025-1505 The Effects of Within Firm Collaboration and Between Firm Collaboration on Firm Performance

Amelia Carr, Professor, Bowling Green State University, United States

The study discusses collaboration within and between firms. We explore the research question, "Does collaboration between firms contribute to the firm's performance?" Data from 223 firms is used to test the hypotheses. The results of the study, implications for management thought, and directions for future research are discussed.

025-1649 Supplier relationship management and firm performance

Ping Wang, Associate Professor, Tianjin University, China
James Hill, Associate Professor, Ohio State University, United States

Supplier relationship management has been viewed as a mechanism to improve business performance. However, with few exceptions, most studies have not empirically examined the linkages between SRM and firm performance. Based on data collected from China we identify two significant organizational capabilities that mediate the relationship between SRM and performance.

025-1217 Interplay between international purchasing portfolio dispersion and supply chain administration cost

Harri Lorentz, Assistant Professor, Turku School Of Economics, Finland
Juuso Toyli, Professor, University of Turku, Finland
Tomi Solakivi, Lecturer, University of Turku, Finland
Lauri Ojala, Professor, Turku School Of Economics, Finland

Drawing on survey data and using generalized linear modeling, the research investigates the effect of geographic dispersion of purchasing portfolio on supply chain administration cost. Geographic regions are compared in terms of whether consolidation of supply base improves cost performance. The effects are controlled for firm size.

025-0867 The role of global and local supply networks to improve competitiveness in the fashion industry

Antonella Moretto, Student, Politecnico Di Milano, Italy
 Federico Caniato, Associate Professor, Politecnico Di Milano, Italy
 Pamela Danese, Assistant Professor, Universita Degli Studi Di Padova, Italy
 Andrea Vinelli, Professor, Universita Di Padova, Italy
 Laura Macchion, Student, Universita Degli Studi Di Padova, Italy

Time-based competition and sustainability have driven fashion companies to reorganize their supply networks searching for a new balance between local and global sourcing and production. This survey-based research provides insights on how fashion companies redesign sourcing and production configurations to improve operational and economical performance and better serve global markets.

342	Monday, 10:00 AM - 11:30 AM, Ballroom C (Floor 5) <i>Track:</i> Healthcare Operations
	<i>Session:</i> Quality, Productivity and Efficiency in Healthcare: Brazilian Perspective
	<i>Chair(s):</i> Manoela Lahoz

025-0276 Evaluating the efficiency of the hospital management - comparing public and private hospitals

Vidigal Martins, Associate Professor, Universidade Federal de Uberlandia, Brazil
 Chen Yen-Tsang, Student, Fundacao Getulio Vargas, Brazil
 Peterson Gandolfi, Professor, Universidade Federal de Uberlandia, Brazil
 Renata Paulo, Professor, Universidade Federal de Uberlandia, Brazil

Analyzing the performance of the hospitals through Data Envelopment Analysis is possible to establish their ranking as well as the optimum values for inputs/outputs of the hospital management. This research employed the DEA technique and elaborated a ranking of efficiency of the public hospitals and variables that improve their practices.

025-0376 Why doesn't it work so well? Analysis of a healthcare program in a Municipal Health Department

Maria Grazia Justa, Student, FGV-EAESP, Brazil
 Ana Maria Malik, Associate Professor, FGV-EAESP, Brazil
 Claudia Meirelles, Municipal Secretary of Health, Porto Feliz Health Secretariat, Brazil

Priorities of Brazilian Health System are not always successful. In Porto Feliz, a municipality with less than 100.000 inhabitants enhanced programs regarding diabetes and hypertension for senior citizens. Indicators show that the utilization of the program structure is smaller than expected. Process analysis showed there is room for improvement.

025-0633 Quality Evaluation of Brazilian National Health System (SUS) by the Perspective of Patient Satisfaction

Andrea Michelucci Malanga, Professor, Sumare University, Brazil
 Suzana Souza Santos, Professor, Universidade Mackenzie, Brazil

This research aims to evaluate the quality of Prenatal Services provided by public network in the perspective of patient satisfaction. The results propose to contribute to the knowledge level of patient satisfaction and the identification of potential problems which directly impact the network quality service.

025-0886 Indicators of productivity and working conditions: representations in the company

João Camarotto, Professor, Universidade Federal De São Carlos, Brazil
 Manoela Lahoz, Student, Universidade Federal De São Carlos, Brazil

Social construction of safety and its relationship with indicators of performance operations. It is to see how companies relate efficiency of operations with indicators of working conditions, particularly for reasons of absenteeism from work accidents. Research carried out in four large Brazilian companies.

343	Monday, 10:00 AM - 11:30 AM, Kansas City (Floor 5) <i>Track:</i> Healthcare Operations
	<i>Session:</i> Coordinating Healthcare Supply Chains
	<i>Chair(s):</i> John Gardner

025-0861 A Supply Chain Network Oligopoly Model for Pharmaceuticals under Brand Differentiation and Perishability

Amir Masoumi, Student, University Of Massachusetts Amherst, United States
 Min Yu, Student, University Of Massachusetts Amherst, United States
 Anna Nagurney, Professor, University Of Massachusetts Amherst, United States

We propose a generalized network oligopoly model for supply chains of pharmaceutical products where the consumers differentiate among the products of competing firms. We investigate the complex challenge faced by the pharmaceutical industry, where an expensive brand loses its dominant market share as a consequence of patent rights expiration.

025-0853 Supply Chain Network Design of a Sustainable Blood Banking System

Anna Nagurney, Professor, University Of Massachusetts Amherst, United States
 Amir Masoumi, Student, University Of Massachusetts Amherst, United States

We develop a sustainable network design/redesign model for the complex blood supply chain. Our multicriteria system-optimization approach on networks with arc multipliers captures critical concerns of blood banking systems such as determination of the optimal capacities and allocations, supply-side risk, and the induced cost of discarding potentially hazardous blood waste.

025-0859 A Chance-Constrained Approach to Solve Drug Shortage Problems

Shanling Li, Professor, McGill University, Canada
 Lijian Chen, Assistant Professor, University Of Louisville, United States

In this research, we formulate the medical supply distribution as a chance-constrained programming model with the objective to minimize the total expected cost subjected to imposed service levels for drugs under the uncertainties of demand and supply. We solve it by a novel Monte Carlo approach with polynomial computational complexity.

025-1425 Efficiency and Patient Safety through Healthcare Coordination Mechanisms

John Gardner, Student, Ohio State University, United States
 Kenneth Boyer, Professor, Ohio State University, United States
 Peter Ward, Professor, Ohio State University, United States

This research examines a model of how two coordination mechanisms in hospitals - process reviews and information systems - improve process performance in light of tensions between efficiency and patient safety. We test how these mechanisms relate to one another and how they function under systematic organizational differences.

344	Monday, 10:00 AM - 11:30 AM, Wisconsin (WI) (Floor 6)	<i>Track:</i> OM in Latin America and the Caribbean
	<i>Session:</i> Operations Management in Brazil	
	<i>Chair(s):</i> Matthias Thurer	

025-0827 Grid computing for a stochastic product-mix problem in Brazil

Rafael Barbastefano, Associate Professor, Centro Federal De Educacao Technologica - Cefet, Brazil
 Luiz Souza, Student, Centro Federal De Educacao Technologica - Cefet, Brazil
 Diego Carvalho, Professor, Centro Federal De Educacao Technologica - Cefet, Brazil

This work presents a stochastic programming model designed to solve a product-mix problem in a continuous production system. Grid computing is used to simulate product-mix configurations for several trials. Impacts on profit margin and capacity are discussed and explored, showing trends of expected improvements in company's operations.

025-1141 Information Systems (IS) in Order to Support Management Decision Making Process in Sao Paulo, Brazil

Alberto Suen, Professor, Universidade Metodista de Sao Paulo, Brazil
 Clovis Galdino, Student, Universidade Metodista De Sao Paulo, Brazil
 Joao Santos, Professor, Universidade Metodista De Sao Paulo, Brazil

Nowadays the complexity of the organizations environment in which demands efficient information systems (IS) in order to support management Decision Making Process is very high. The present semi-structured field inquiry takes a purpose the mapping of current situation of industrial Enterprises located in the state of Sao Paulo.

025-0369 Impact of different types of inventory control on inventory accuracy

Everton Drohomeretski, Assistant Professor, FAE Centro Universitario, Brazil
 Fabio Favaretto, Professor, Federal University of Itajuba, Brazil

This paper identifies how various types of inventory control affect inventory accuracy. The approach adopted involved the use of multiple cases in Brazilian companies. The study correlates different types of inventory control with the inventory accuracy index and shows the relationship between types of control and the accuracy index.

025-0577 Developments, Opportunities and Challenges faced by Small Manufacturers in Brazil: An Exploratory Survey

Matthias Thurer, Student, Universidade Federal De São Carlos, Brazil
 Moacir Godinho Filho, Associate Professor, Universidade Federal De São Carlos, Brazil
 Mark Stevenson, Lecturer, Lancaster University, United Kingdom
 Lawrence Fredendall, Professor, Clemson University, United States

Small manufacturers account for one third of employment and one fifth of overall production in Brazil. Despite their importance, little is known about how they compete or their future opportunities and challenges. This study closes this gap providing guidance for future research and developing propositions for further inquiry.

345	Monday, 10:00 AM - 11:30 AM, River North (Floor 2)	<i>Track:</i> Supply Chain Management
	<i>Session:</i> Topics in Supply Chain Management	
	<i>Chair(s):</i> Steve Melnyk	

025-1500 Exploring Supply Chain Talent Needs

Nick Little, Lecturer, Michigan State University, United States
 Roberta Russell, Professor, Virginia Polytechnic Institute And State University, United States
 Michael Hadley, Supply Chain Manager, Boeing, United States

This session reports on the work of the Supply Chain Talent Academic Initiative (SCTAI) to identify the skills and competencies required of today and tomorrow's supply chain managers. We provide data on the skills gap between industry needs and academic initiatives, and suggest ways to bridge the gap.

025-1444 The Blended Outcome Enterprise

Steve Melnyk, Professor, Michigan State University, United States
 Stanley Griffis, Associate Professor, Michigan State University, United States
 Christopher Fleming, Student, Michigan State University, United States

Organizations must balance a series of outcomes to effectively serve the critical customer. While these outcome combinations may be complementary or conflicting, the selected outcomes must follow the enterprise's business model strategy - customer, value proposition, capabilities - to succeed. Multiple cases are provided to prove the model.

025-0024 Procedure for Analysing Effects of Changeability on Logistics Structures in Value Chain Networks

Mehmet Özsahin, Student, Univerity of Bremen, Germany
 Bernd Scholz-Reiter, Professor, Universitat Bremen, Germany
 Susanne Schukraft, Student, Universitat Bremen, Germany

Logistics structures in value chain networks (VCN) are faced with dynamically changing influences and flexible adaptations with a short-term horizon are seldom sufficient. Rather, changeable network structures are necessary. The full paper describes an analytical procedure to identify change demand and bring out changeability effects onto logistics structures of VCN.

025-0442 Social Exchange Theory in Supply Chain Management

Alexandrino Lucas-dos-Santos, Student, University Of São Paulo, Brazil
 Janaina Siegler, Student, Fundacao Getulio Vargas, Brazil
 Luiz Brito, Professor, Fundacao Getulio Vargas, Brazil

This paper presents an analysis of a comprehensive sample of empirical articles using Social Exchange Theory (SET) applied to buyer-suppliers relationships. The study identifies the main constructs used, argues its explanatory power, and demonstrates how it relates to other theories. It concludes that SET has been underutilized by OM scholars.

349	Monday, 10:00 AM - 11:30 AM, Minnesota (MN) (Floor 6)	<i>Track:</i> Inventory Management
	<i>Session:</i> Inventory Strategy	
	<i>Chair(s):</i> Ram Roy	

025-1303 Trends in indoor and outdoor visibility in supply chains

Ahmed Musa, Senior Lecturer, The University of Central Lancashire, United Kingdom
 Yahaya Yusuf, Professor, University of Central Lancashire, Preston, United Kingdom

This paper discusses several technologies for achieving item-centric and bulk visibility in supply chains, their selling points and limitations, cost of adoption and maintenance, user needs that they meet, as well as potential future trends. The technology adoption curve and some case studies of adoption are included in the paper.

025-1027 A strategy for managing safety stock in Closed-Loop Supply Chains

Andrea Buccini, Student, "Tor Vergata" University of Rome - Department of Enterprise Engineering, Italy
 Massimiliano Schiraldi, Assistant Professor, University Of Rome - Tor Vergata, Italy

The paper presents and evaluates a strategy for managing the return flow in order to increase service level in a stochastic scenario. The aim is to exploit the opportunity of relocating safety stocks from a serviceable inventory to a remanufacturable inventory, in order to reduce stockholding costs.

025-0640 The Just-in-time-Kanban Method is Just the Two-Bin Classic Inventory System

Claude Machline, Emeritus Professor, Centro Universitário São Camilo, Brazil

The Just-in-Time-Kanban method constitutes an application of the well-known classic two-bin system, like some researchers have already hinted at. This paper shows in theory and practice the similarities existing between the JIT-KANBAN method and the classic economic lot size, order point inventory system.

025-0089 ABC, VED and FSN Analysis with a Twist: Can They Tango Together to Entertain Inventory Managers?

Ram Roy, Senior Lecturer, Eastern Institute Of Technology, New Zealand

Paper investigates a liquor-store presently having unscientific inventory control and storage methods where pallets are stacked on top of one another causing damage to products, and making it difficult to find specific product. Selective control techniques have been used to manage inventory in a very cost effective and efficient manner.

350	Monday, 10:00 AM - 11:30 AM, Indiana (Floor 6)	<i>Track:</i> OM in Latin America and the Caribbean
	<i>Session:</i> Social Responsibility, Strategic Planning, and Education	
	<i>Chair(s):</i> Luiz Alves	

025-1054 Socially Responsible Structural Change of the Colombian Clothing Industry

Jorge Medina, Professor, Universidad Sergio Arboleda, Colombia

In Colombia, the greatest percentage of clothing companies is very small. A change in the structure of the industry arises. It could be done strengthening the middle that can be "world class" by using the production capacities of the small ones, having in mind to make the operation socially responsible.

025-1380 Corporate Online Training: Is it really Effective?

Maria Gouvea, Associate Professor, University Of São Paulo, Brazil
 Daielly Nassif Mantovani, Student, University Of São Paulo, Brazil

This paper aims to discuss in a critical way the effectiveness and impact of training and development programs, considering the online, technology enhanced, model. For that, the research has a qualitative approach, which includes interviews with online courses coordinators in Brazil.

025-1622 Strategic planning process in a third sector organization in South of Brazil

Alvaro Gehlen de Leao, Professor, Pontifical Catholic University Of Rio Grande Do Sul, Brazil
 Ana Lucia Suarez Maciel, Professor, Pontifical Catholic University Of Rio Grande Do Sul, Brazil
 Andre Hartmann Duha, Professor, Pontifical Catholic University Of Rio Grande Do Sul, Brazil

In recent years, as a result of the growing importance of the third sector entities, the strategic planning in non-profit organizations has turned into a key element for their survival and this paper describes the results that emerged out of the process implemented at the Irmao Jose Ottao Foundation.

025-1228 Model for Applying Strategic Planning in Educational Institutions

Paula Martins, Student, Universidade Federal De Juiz De Fora, Brazil
 Luiz Alves, Professor, Universidade Federal De Juiz De Fora, Brazil

The paper presents a model for applying strategic planning in an educational institution. The model was tested in a high school in southeastern Brazil, and proved to be effective in helping to significantly increase student enrollment and the quality of instruction.