



INDIANA UNIVERSITY  
BLOOMINGTON

**OPERATIONS AND DECISION TECHNOLOGIES**  
DEPARTMENT



**KELLEY SCHOOL OF BUSINESS**  
GO FROM MOMENT TO MOMENTUM



## **OPERATIONS AND DECISION TECHNOLOGIES**

The Operations and Decision Technologies (ODT) department is the home to innovative programs in supply chain and operations management, business analytics, decision sciences and operations research, and information systems management. Our supply chain and operations management curriculum focuses on the operation of the entire supply chain, from suppliers to manufacturers to the customer and everything in between. Our business analytics, decision sciences and operations research curriculum focuses on extensive use of data, statistical and quantitative analysis, explanatory and predictive modeling, and fact-based management to drive decision making. Finally, our information systems curriculum blends business and technology curriculum to innovatively apply IT to better lead enterprises in this digital age.

This brochure presents curriculum highlights as well our engagement in different programs within supply chain and operations management, business analytics, decision sciences and operations research, and information systems management. It includes research themes that are pursued by our faculty. Finally, we present ODT alumni spotlight.

## **SUPPLY CHAIN AND OPERATIONS MANAGEMENT**

p. 1-2

## **BUSINESS ANALYTICS, DECISION SCIENCES, AND OPERATIONS RESEARCH**

p. 3-4

## **INFORMATION SYSTEMS**

p. 5-6

## **ODT RESEARCH THEMES AND ALUMNI SPOTLIGHT**

p. 7-8

## Supply Chain and Operations Management

For a firm to deliver its promise to customers, it must be able to utilize its resources to achieve a profitable balance between supply and demand. To reach this goal, supply chain management aligns the firm's manufacturing and service resources with suppliers, internal partners in finance, accounting, marketing and information systems, distribution channels, and customers.

Our undergraduate and graduate majors provide students with knowledge and skills for all facets of supply chain and operations management: supply chain strategy and analytics, sourcing, operations, and logistics. The curriculum supports several synergistic dual majors.

ODT

### SUPPLY CHAIN STRATEGY AND ANALYTICS

- Strategic fit between supply chain and internal partners
- Forecasting
- Sales and operations planning
- Inventory planning
- Supply chain contracts
- Role of pricing in supply chains
- Information technology in supply chains
- Digital supply chain

### SOURCING

- The decision to make vs. buy
- Total cost of ownership
- Supplier selection
- Supply risk management

### OPERATIONS

- Process design
- Capacity and bottlenecks
- Lean operations
- Sustainable operations
- Project management

### LOGISTICS

- Network design
- Global supply chains
- Transportation in a supply chain
- Distribution networks

## SUPPLY CHAIN AND OPERATIONS MANAGEMENT

### UNDERGRADUATE MAJOR IN SUPPLY CHAIN MANAGEMENT

The supply chain management major equips students with organizational and analytical skills to help deliver the right product or service to the right place at the right time. Supply chain managers often work across organizational boundaries and with partners spanning the globe.

- URL: <http://tinyurl.com/odtug>

### UNDERGRADUATE MAJOR IN OPERATIONS MANAGEMENT

The operations management major focuses on improving the internal processes of an organization. The major provides students with skills such as process analysis, project management, and quality assurance, which complements the skill sets of managers in diverse fields such as finance, accounting, or marketing.

- URL: <http://tinyurl.com/odtug>

### UNDERGRADUATE OPERATIONS CONSULTING WORKSHOP

The workshop introduces undergraduate students to the business operations client base from multi-industry perspective and provides an overview of business operations consulting frameworks.

- URL: <https://tinyurl.com/odtbopcw>

### UNDERGRADUATE DIGITAL LOGISTICS & TRANSPORTATION WORKSHOP

The workshop introduces undergraduate students to careers in logistics and transportation in the context of recent trends in digital business.

- URL: <https://tinyurl.com/odtdlt>

### MBA MAJOR IN SUPPLY CHAIN AND OPERATIONS

The supply chain and operations major provides MBAs with a system wide perspective on the flow of material, information, and funds across the supply chain. This major prepares students to apply analytical skills to address supply chain challenges, manage the internal partners with external stakeholders, and effectively work with clients and suppliers across the globe.

- URL: <http://tinyurl.com/odtmbasc>

### MBA SUPPLY CHAIN ACADEMY

The supply chain academy prepares MBA students for long-term career success in supply chain management by providing personalized pedagogical experiences that complement Kelley's academic curriculum.

- URL: <http://tinyurl.com/odtsca>

### MS IN GLOBAL SUPPLY CHAIN MANAGEMENT

An online MS in global supply chain management focuses on advancing the careers of supply chain managers by meeting the demands of today's global market along with maximizing financial goals of business.

- URL: <http://tinyurl.com/odtgsc>

### PHD IN OPERATIONS MANAGEMENT

The doctoral program in operations management prepares academic scholars who focus on the strategic and tactical problems faced by organizations that seek to transform resources—such as labor, capital, energy, and materials—into goods and services over the entire supply chain.

- URL: <http://tinyurl.com/odtopsphd>

### STUDENT CLUBS

- Systems and Operations Management Association (SOMA)  
(<http://kelley.iu.edu/soma/>)
- Supply Chain and Operations Management Association (SCOMA)  
(<http://kelley.iu.edu/scoma/>)

## Business Analytics, Decision Sciences, and Operations Research

Quantitative methods such as business analytics, decision sciences and operations research are about using data to make better business decisions. For years, companies have collected data about their practices and consumers. Now thanks to inexpensive computing, more and more companies are putting their data to work—using techniques such as predictive analytics, optimization, econometric techniques, and simulation—to make fact-based decisions that improve productivity, increase profits, and create a competitive advantage.

Our undergraduate co-major, the MBA major/minor and online programs provide knowledge and skills for all facets of business analytics: employing analytics for business transformation, data analytics, decision and causal modeling, data understanding and preparation, and statistical inference and visualization. The curriculum supports several synergistic dual majors.



### EMPLOYING ANALYTICS FOR BUSINESS TRANSFORMATION

- Applying analytic lens to business problems
- Align, plan and govern analytics deployment
- Evolving business models for the digital enterprise

### DATA ANALYTICS

- Predictive analytics, data mining and machine learning
- Text and social media network analytics
- Web analytics
- Big data analytics
- Sensor data analytics

### DECISION AND CAUSAL MODELING

- Analytical decision modeling – optimization
- Stochastic decision modeling – Monte Carlo simulation, discrete event simulation
- Time-series analysis and forecasting
- Data-driven experimentation

### DATA UNDERSTANDING AND PREPARATION

- Data quality assessment
- Data preparation for analytics

### STATISTICAL INFERENCE AND VISUALIZATION

- Exploring and visualizing data
- Descriptive statistics and statistical inference

## BUSINESS ANALYTICS, DECISION SCIENCES, AND OPERATIONS RESEARCH

### UNDERGRADUATE CO-MAJOR IN BUSINESS ANALYTICS

The business analytics co-major provides undergraduate students the opportunity to complement their primary major with advanced business analytics skills, allowing them to better integrate data-driven insights into their analyses and decision-making. This co-major can be paired with any other Kelley School of Business undergraduate major.

- URL: <https://tinyurl.com/odtugba>

### BUSINESS ANALYTICS CONSULTING WORKSHOP

This workshop provides an experiential learning opportunity into the lifecycle of business analytics consulting.

- URL: <https://tinyurl.com/odtbacw>

### MBA MAJOR AND MINOR IN BUSINESS ANALYTICS

In the MBA program, a major or minor in business analytics focuses on data-driven insights that can help enhance customer relationships, improve productivity, and better manage costs and risks in an organization.

- URL: <http://tinyurl.com/odtmbaba>

### ONLINE MS IN BUSINESS ANALYTICS

An online MS in business analytics equips students with a multitude of analytic techniques that can help generate insights for decision making: inferential statistics and visualization, data analytics, simulation, optimization and econometrics, big data analytics, and data-driven experimentation. It also delves into managerial issues related to aligning, planning and deploying analytics initiatives.

- URL: <http://tinyurl.com/odtkdbua>

### CERTIFICATE PROGRAM IN BUSINESS ANALYTICS

A 12 credit-hour certificate in business analytics provides an introduction to detecting trends, predicting the most-likely scenarios and making optimal decisions about everything from daily operations to high-level strategies.

- URL: <http://tinyurl.com/odtcerba>

### PHD IN DECISION SCIENCES

The doctoral program in decision sciences prepares students for an academic career in the study of mathematical and analytical methods used in decision making.

- URL: <http://tinyurl.com/odtdsphd>

### INSTITUTE FOR BUSINESS ANALYTICS

The Institute for Business Analytics, a Kelley School of Business initiative, brings together students, faculty and corporate partners in various analytics-related initiatives: specialized forums, analytics leadership award, predictive analytics and data viz challenge, corporate guest talks, showcasing students, faculty and corporate partners in the *OnAnalytics* magazine, and Kelley's Business Analytics Day.

- URL: <http://kelley.iu.edu/iba>

### STUDENT CLUB

- Business Analytics Club at Kelley (<https://tinyurl.com/kaclub>)

## Information Systems

Information systems are important for day-to-day operations as well as strategic management of businesses. Information systems management involves analysis, design, implementation and operation of computer-based information systems, which is becoming increasingly important to leading enterprises in innovative ways.

Our undergraduate major/co-major and graduate programs – with a blended business-technology curriculum – focus on multiple facets of information systems management: IT strategy and management, enterprise process management, enterprise data management, IT infrastructure management and application development. The curriculum supports several synergistic dual majors.

ODT

### IT STRATEGY AND MANAGEMENT

- IT strategy
- IT consulting
- Integration of systems and business
- Digital innovation
- Business digital platforms

### ENTERPRISE PROCESS MANAGEMENT

- Systems analysis and design
- Business process management
- Enterprise system management
- Design thinking
- Project management

### ENTERPRISE DATA MANAGEMENT AND ANALYTICS

- Design and storage of enterprise data systems
- Data access using database querying languages
- Data integration, master data management, and data quality management
- Enterprise reporting and analytics
- Business intelligence systems
- Big data technologies

### IT INFRASTRUCTURE MANAGEMENT

- Information systems security
- IT risk management
- IT architecture
- Cloud computing

### APPLICATION DEVELOPMENT

- Business application development
- Mobile application development
- Managing systems development

## INFORMATION SYSTEMS

### UNDERGRADUATE MAJOR IN INFORMATION SYSTEMS

The information systems (IS) major focuses on information technology (IT) and process issues for operating and managing large, distributed global businesses: integrating business with systems, designing processes as well as the associated data, managing the IT infrastructure, and developing business applications.

- URL: <http://tinyurl.com/odtug>

### UNDERGRADUATE CO-MAJOR IN DIGITAL TECHNOLOGY MANAGEMENT

The digital technology management co-major is for students who would like a background in information technology and the roles they play in the different aspects of business. This co-major is designed to complement a functional area major such as finance, accounting, marketing or supply chain management.

- URL: <http://tinyurl.com/odtug>

### UNDERGRADUATE TECHNOLOGY CONSULTING WORKSHOP

The workshop prepares undergraduate students to find and secure internships and full-time jobs in technology consulting and in corporate areas that require creative problem solutions with the use of information technology.

- URL: <http://tinyurl.com/odttcw>

### MS IN INFORMATION SYSTEMS

Combining technical, business and managerial expertise, an MS in information systems equips students in effective use of information technology to address business problems. Its innovative curriculum includes three concentrations: enterprise systems, business intelligence and analytics, and enterprise risk management.

- URL: <http://tinyurl.com/odtmsis>

### ONLINE MS IN INFORMATION TECHNOLOGY MANAGEMENT

The MS in IT Management is designed for working professionals in information technology (IT) who are looking to accelerate their careers. We created this new online degree program to meet the growing demand for IT leaders, developing a curriculum that will prepare students from both business and IT backgrounds to meet current market needs for CIOs and other tech visionaries.

- URL: <https://tinyurl.com/odtmsitm>

### PHD IN INFORMATION SYSTEMS

The doctoral program in information systems prepares academic scholars who concentrate on how business technologies are designed, developed, and used to enable and empower individuals, teams, processes, organizations, and the society.

- URL: <http://tinyurl.com/odtisphd>

### INSTITUTE FOR THE DIGITAL ENTERPRISE

Kelley's Institute for the Digital Enterprise (IDE) serves the interests of students, faculty and corporate partners by providing thought leadership, research opportunities, and linkages to ideas and information in technologies that enable the digital enterprise.

### STUDENT CLUBS

- Technology Management Club (<http://kelley.iu.edu/tmc/>)
- MSIS Association (<http://kelley.iu.edu/MSISA/>)
- Women in Business Technology (<https://tinyurl.com/winbustech>)

# ODT RESEARCH THEMES

## SUPPLY CHAIN AND OPERATIONS MANAGEMENT

### SUPPLY CHAIN MANAGEMENT

- Strategic sourcing
- Production and inventory management
- Product recalls
- Supply risk management
- Location-routing problems

### SERVICE & RETAIL OPERATIONS

- Omni-channel management
- Service quality and design
- Pricing and revenue management

### HEALTHCARE OPERATIONS

- Hospital operations and patient flow
- Hospital staffing
- Clinical trial design
- Capacity planning in healthcare delivery

### SUSTAINABLE OPERATIONS

- Reverse logistics
- Closed-loop supply chain
- Triple bottom line

### HUMAN BEHAVIOR AND OPERATIONS

- Operational implications of consumer behavior
- Collaboration and competition in supply chains

### HUMANITARIAN & SOCIALLY RESPONSIBLE OPERATIONS

- Disaster preparedness and response
- Recovery operations
- Coordination within humanitarian organizations

### ENERGY RESOURCE MANAGEMENT

- Renewable energy integration
- Energy market competition
- Energy resource investment and operations
- Energy demand management

## BUSINESS ANALYTICS, DECISION SCIENCES, AND OPERATIONS RESEARCH

### HEALTHCARE ANALYTICS

- Predicting disease progression
- Patient-centric healthcare models
- Decision support for hospitals
- Policy for healthcare coalitions including insurers and Medicare
- Social media and healthcare

### ANALYTICS-DRIVEN DECISION MAKING

- Markov decision process
- Bayesian information modeling
- Queueing theory
- Optimization
- Dynamic Programming

### SOCIAL MEDIA ANALYTICS

- Organizational and public policy outcomes from social media platforms
- Role of live chatting tools

### WORKFORCE ANALYTICS

- Role of IT in the displacement of service workers
- Online labor markets
- Staffing and turnover

### SENSOR-BASED AND REAL-TIME ANALYTICS

- Internet of Things (IoT) sensor analysis
- Industrial Control Systems (ICS) cybersecurity
- AI-based methodologies for cyber-security

### WISDOM OF THE CROWD

- Philanthropic crowdfunding
- Judgment aggregation
- Quantifying uncertainty

### ONLINE PLATFORMS AND RECOMMENDATION SYSTEMS

- Algorithm design for recommendation engines
- Marketplace design in the context of B2B platforms

## INFORMATION SYSTEMS

### ARTIFICIAL INTELLIGENCE, CHATBOTS, VIRTUAL AGENTS

- Trustworthiness of chatbots
- Effect of human realistic face on AI agents
- Artificial Intelligence for cybersecurity

### IT IMPLEMENTATION AND ADOPTION

- Adoption, use, and impact of technology
- IT-enabled change management
- Business process change

### IT-ENABLED DECISION MAKING

- Impact of recommender system on decision making
- IT for the subconscious

### DESIGN OF IT SYSTEMS

- Heuristics and biases in systems design
- Science of design
- Explainable AI for cyber threat intelligence

### INFORMATION GOODS

- Online piracy of digital goods
- Implementing cybersecurity policies
- Smart and large-scale vulnerability assessment and management
- Dark Web Analytics
- Strategies for reducing the impact of fake news and deceptive product reviews

### IT AND SOCIAL MEDIA PLATFORMS

- Platform-based healthcare communities
- Engagement on social media platforms

### COMPUTER-MEDIATED COLLABORATIVE WORK

- Virtual teams
- Online collaboration
- Social media and virtual worlds

# ODT ALUMNI



### ANNIE OLER, KELLEY SCHOOL OF BUSINESS, BS - SUPPLY CHAIN AND FINANCE 2008.

Senior Manager, Continuous Improvement, Sales Operations, Grainger.

*"I manage a supply chain team tasked with partnering our suppliers and product management organization to optimize our product procurement strategies. I get to work on challenging cross-functional projects, while learning new things and partnering with different people across the organization."*



### JEFFERSON BARROS, KELLEY SCHOOL OF BUSINESS, MBA - SUPPLY CHAIN AND BUSINESS ANALYTICS 2014.

Program Manager, Supply Chain Design, Google.

*"I recently joined Google as a Program Manager for Supply Chain Design, providing tactical support and analytical recommendations to the Global Infrastructure group in planning and inventory. The work relies heavily on data analytics concepts to drive operational improvements and being around so many smart people pushes me to be on the top and deliver fast and intelligent solutions. I'm glad I experienced a good mix of analytics and supply chain while I was in Kelley."*



### NOVITA MAHARANI DWI, KELLEY SCHOOL OF BUSINESS, MBA - BUSINESS ANALYTICS AND FINANCE 2018.

Senior Consultant, Deloitte Consulting.

*"I was involved in IoT planning for a conglomerate client during my summer internship. I consulted with multiple stakeholders ranging from potential B2B clients, technical specialist, IoT experts, and potential vendors to create initial MVP (minimum viable product) ideas. I developed financial projection through leveraging knowledge from Business Analytics and Finance that I obtained from the Kelley MBA Program."*



### JOHN BORG, KELLEY SCHOOL OF BUSINESS, MBA - BUSINESS ANALYTICS AND FINANCE 2012.

Vice President of Analytics, Angie's List.

*"I manage a team of business analysts and data scientists whose mission is to provide information and insights to our stakeholders that enable them to make sound tactical and strategic decisions."*



### LINWOOD WATKINS III, KELLEY SCHOOL OF BUSINESS, BS - INFORMATION SYSTEMS 2011 AND MS IN INFORMATION SYSTEMS 2012.

Consultant at Inspire11.

*"As an IT consultant, I play the role of a business analyst and help bridge business process with IT systems. My role involves process mapping, creating design documentation, and testing the solution."*



### KYLIE CHERCO, KELLEY SCHOOL OF BUSINESS, BS - MANAGEMENT 2012 AND MS IN INFORMATION SYSTEMS 2013

Manager, Deloitte Consulting.

*"I apply my technology and business knowledge to understand my client's challenges and analyze the current state of their analytics and information management capabilities. I design and implement solutions that deliver powerful insights to my client's organization and help them achieve their future state vision by connecting people, business, and technology."*



**INDIANA UNIVERSITY**  
BLOOMINGTON

Nonprofit Organization  
U.S. Postage  
PAID  
Bloomington, IN  
Permit No. 2

## FACULTY

### S. Chris Albright

Professor Emeritus

### Frank Akaiwa

### Joseph Baird

### Hillol Bala

Conrad Prebys Professor;  
Co-Director, Institute for Digital  
Enterprise

### George Ball

Arthur M. Weimer Faculty Fellow

### Alex Barsi Lopes

GT Faculty Scholar; Associate Faculty  
Chair, Kelley Direct Program

### Doug Blocher

### Kurt Bretthauer

James A. Caplin, M.D., Professor

### Carl Briggs

Fettig/Whirlpool Faculty Fellow;  
Co-Director, Business Operations  
Consulting Workshop

### Kyle Cattani

SungKyunKwan Professor;  
Chair, MBA Program

### Oguz Cetin

### Christopher Chen

### Russ Clark

Co-Director, Supply Chain and  
Digital Enterprise Academy;  
Co-Director, Digital Logistics and  
Transportation Workshop

### Michael Collins

### Rex Cutshall

Deloitte Distinguished I-Core Lecturer;  
I-Core Coordinator

### Alan Dennis

John T. Chambers Chair of  
Internet Systems

### Joshua Dennis

Co-Director, Technology  
Consulting Workshop

### Scott Dobos

### Tony Emmons

### Michael Frutiger

Co-Director, Technology  
Consulting Workshop

### Fei Gao

### Tom Gregory

Co-Director, Institute for  
Digital Enterprise

### Jonathan Helm

GT Faculty Scholar; Co-Director,  
Center for the Business of Life  
Sciences

### John D. Hill

GT Faculty Scholar; Co-Director,  
Supply Chain and Digital Enterprise  
Academy; Co-Director,  
Digital Logistics and  
Transportation Workshop

### F. Robert Jacobs

Professor Emeritus

### Fujie Jin

### Kari Johnson

Kimball International, Inc.  
Distinguished Lecturer; K303  
Coordinator; Co-Director, Business  
Analytics Consulting Workshop

### Maryam Khatami

### Vijay Khatri

Judith Norman Davis and Kim G. Davis  
Professor of Business Analytics;  
Chair, ODT Department; Co-Director,  
Kelley Institute for Business Analytics

### Antino Kim

GT Faculty Scholar

### J. Eric Kinser

Co-Director, GT-IDEA

### Mani Lakshmanan

### Jie Li

### Che-Wei Liu

### Vincent A. Mabert

Professor Emeritus

### Taryn Malher

### Jorge Mejia

GT Faculty Scholar

### Jay Newquist

### Asa Palley

### Rodney Parker

Fettig/Whirlpool Faculty Fellow

### Alfonso Pedraza Martinez

Grainger Faculty Fellow

### James H. Patterson

Professor Emeritus

### Xiaoshan Peng

### William Perkins

Professor Emeritus

### Aaron Perry

### Bipin Prabhakar

Fettig/Whirlpool Faculty Fellow;  
Chair, Information Systems  
Graduate Program

### Kent Rerko

### Christopher Robbins

### Sagar Samtani

GT Faculty Scholar

### Paul Serex

### Siddhartha Sharma

### Sarah Sherry

### Ash Soni

SungKyunKwan Professor;  
Executive Associate Dean for  
Academic Programs

### Gilvan Souza

Ming Mei Chair in Business

### Jane Tan

### Ramesh Venkataraman

John R. Gibbs Professor

### M. A. Venkataramanan

Jack R. Wentworth Professor;  
Vice Provost for Finance and Strategy

### Sebastian Villa Betancur

### Katie Votolato

Co-Director, Business Operations  
Consulting Workshop

### Brad Wheeler

James H. Rudy Professor

### Wayne L. Winston

Professor Emeritus

### Owen Wu

GT Faculty Scholar

### Lucy Yan

GT Faculty Scholar

### Ozge Yapar

### Jingjing Zhang

Fettig/Whirlpool Faculty Fellow

### Wenchang Zhang

## STAFF

### Rachel Brummett

### Kailee Cooper

### Sarah Hall

## STAY IN TOUCH

Email: [odt@indiana.edu](mailto:odt@indiana.edu)

Phone: +1 (812) 855-8449

URL: <http://kelley.iu.edu/ODT/>



**KELLEY**  
SCHOOL OF BUSINESS  
GO FROM MOMENT TO MOMENTUM