

2016-2017 | Annual Report



BRIDGING INDUSTRY, STUDENTS, AND FACULTY.

REACHING GLOBALLY

Greetings from the Dauch Center for the Management of Manufacturing Enterprises (DCMME) at the Krannert School of Management at Purdue University. The past year has been exciting – with many new projects started, a case competition, two conferences, the continued TVS Global Internship and many proposals. We have a burgeoning group of students doing projects that grew during the summer to close to 20 at one point. We are here to inform you of our efforts. We have also spent the time planning for the 30th anniversary of the DCMME and you will hear from many of our past leaders at our conferences and on our website.

We have continued our efforts to develop an engagement center where students and industry can experiment with new technologies. If you visit our engagement center (located at the Stewart Center), you will see examples of 3D printing, Augmented Reality applications, drones, sensors etc. But our main goal has been to explore the business justification for such technology adoption and, to this end, we have focused on attracting applied projects where such technology helps improve performance. You will be hearing our experiences with these projects. With grants from the Indiana Manufacturing Center, we have developed several such projects that you will hear about soon. Our global engagement was boosted by the award of a grant from the European Union for a project

with Proctor and Gamble's European research group. A team of faculty and staff were on site in Europe, visiting manufacturing and distribution facilities and collecting data that continues to be analyzed for model development and decision recommendation. This one year project promises to provide both a wonderful learning experience as well as the opportunity for deep research insights. If any of you have ideas for such projects, please give us a call and we will be eager to collaborate.

Our conferences continue to grow in size and variety of topics. All of our events are free and open to the public thanks to the generosity of the sponsors of the center. But we also need your help to keep our topics vibrant and our research relevant to all of you. We look to our industry contacts to help us keep this effort going – after 30 exciting years, we look forward to your assistance for an equally rewarding future.

Thank you to all of the faculty, staff, students and industry members of our DCMME ecosystem. You make us successful and we deeply appreciate your contributions.

Sincerely

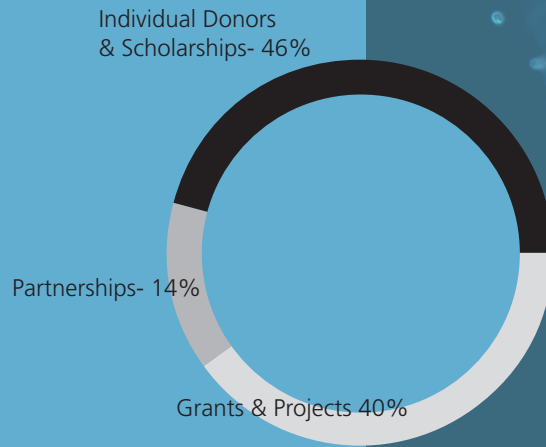


Ananth V Iyer
Susan Bulkeley Butler Chair in Operations
Management
Director, DCMME and GSCMI
Department Head, Management

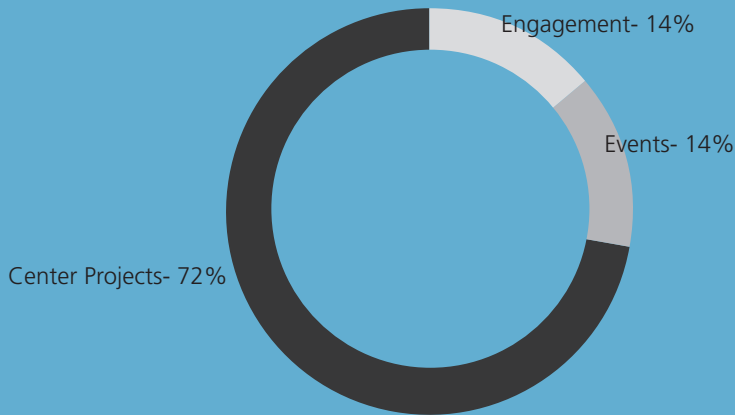


CENTER FINANCIALS

INCOME SUMMARY



EXPENSE SUMMARY



**CELEBRATING THE VITALITY OF
MANUFACTURING & OPERATIONAL
EXCELLENCE**



Dedicated industry partnerships are at the heart of success for the Center. We thank our many distinguished industry partners for their significant and ongoing involvement and support. Our mission and the many important objectives set for the Center could not be accomplished without you.

Thank you.

84

INDUSTRY PARTNERS AND SPONSORS

950

OPTION CERTIFICATE STUDENT RECIPIENTS

302

STUDENT SCHOLARSHIPS

132

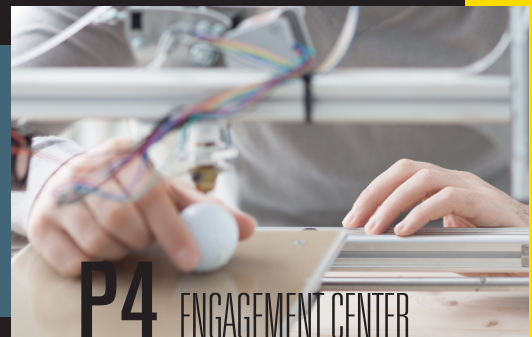
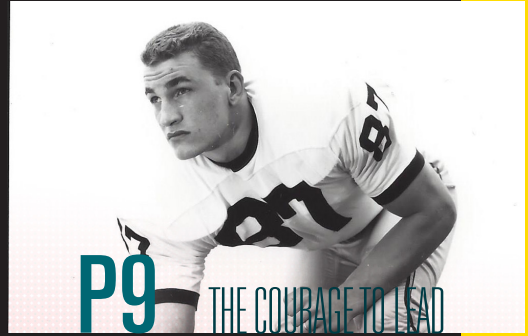
PROJECT STUDENT TEAM MEMBERS

25

COMPANY SCHOLARSHIP DONORS

145

TVS INTERNS



15

INTERNATIONALLY RECOGNIZED: Represented in fifteen countries through education and projects.

58

KRANNERT FACULTY AFFILIATES

398

CONFERENCE AFFILIATED COMPANIES

63

COMPANIES ENGAGED IN PROJECTS

254

INDUSTRY SPEAKERS

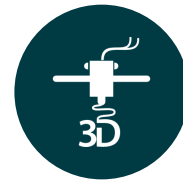
30 YEARS OF MANUFACTURING EXCELLENCE IN REVIEW

SMART LEAN CENTER FOR ENGAGEMENT

Engagement Center opens with multiple objectives: education, demonstration & application

During 2016 we created the Smart Lean Ecosystem Engagement Center with its official opening scheduled during our 2017 spring Supply Chain conference. “The Engagement Center has multiple objectives: education, demonstration and application,” says Steve Dunlop, managing director DCMME. *The center is designed to provide a facility where students, faculty, staff and friends can experience technology that is currently being used or anticipated within manufacturing and supply chain environments.* Below are the primary system areas which will be updated on a routine basis as new technology is developed. There are also a variety of supporting videos displayed to enhance the explanations of the different areas.

- 1) Manufacturing - Small hands-on manufacturing area where participants can build circuit boards with lights and sounds. This area is set up to allow students to experience normal operations as well as interruptions with the parts or materials availability, increased orders, and system break down.
- 2) Drones – This area has small drones that participants can fly within the room and experience both the details needed to achieve steady flight as well as the video capture capability and transfer of data.
- 3) 3D Printing – the demonstration area shows actual 3d printing capability and the degree of accuracy that is available even from a small printer. In the future we hope to have examples of metal 3d printing that is currently



- used in a manufacturing plant.
- 4) Video Analytics – based on cameras mounted on the center ceiling, software is being written to capture the different activities happening in the center.
- 5) Application / testing area for techniques and technology that are being evaluated for our current projects before we suggest possible recommendations to our project sponsors.
- 6) Space has also been allocated to allow for other types of technology and possible uses. Various types of virtual / augmented reality technologies have been used in the center to highlight these emerging areas.
- 7) Google glasses and similar types of technology are presented to allow for hands on use and discussion of potential applications.
- 8) Robotic arms and small programmable robots



EMAIL US AT DCMME@PURDUE.EDU TO SCHEDULE YOUR TOUR.

2016 DCMME MANUFACTURING CONFERENCE

SMART, LEAN ECOSYSTEMS

The 2016 DCMME Manufacturing Conference brought together industry, students and faculty for a focused conference discussion on "Smart, Lean Ecosystems."

MEET OUR SPEAKERS

ANTOINE VAN AGTMAEL-Senior Adviser, Garten Rothkopf and founder, CIO and CEO, Emerging Markets Management, LLC; co-author of The Smartest Places on Earth

BRETT BRUNE-Editor in Chief, Smart Manufacturing Magazine

RHO CAULEY BRUNER-Vehicle Management Systems Integrated, Product Team Lead, Northrop Grumman

CHARLIE CHUNG-Senior Marketing Manager, UPS Supply Chain Solutions

MATS JOHANSSON, President and CEO Eon Reality

BOB NIDA- VP - Organizational Development, Wabash National

KARTHIK RAMANI-Director, C Design Lab, Donald W Feddersen Professor of Mechanical Engineering, Purdue



ANTOINE VAN AGTMAEL (KEY NOTE SPEAKER)



CENTER DESCRIBES ONGOING ZOJILLA PROJECT AND OTHER CENTER COMPANY PROJECT ENGAGEMENTS

Poster competition



THIS COMPETITION WAS CREATED TO BENEFIT BOTH INDUSTRY VISITORS AS WELL AS STUDENTS

by accomplishing three primary objectives:

1) Demonstrate to industry visitors the caliber of summer projects that Krannert students can complete during an internship and provide an alternative resource for locating

student candidates interested in operations and supply chain careers. 2) Provide an opportunity for graduate students to promote their talents and refine their presentation skills by marketing themselves to industry visitors. 3) Expose undergraduate and incoming 1st-year MBA students to the variety of companies and employment opportunities which they might encounter when searching for internship employment themselves. Participating

as judges for the competition, our industry conference guests have the opportunity to meet the competitors individually. Judges listen carefully and ask probing questions as the students articulate their internship work experience and accomplishments. We value all of our participants' preparation and willingness to share their experiences with us at the conference.



Professor Karthik Ramani (conference speaker) provided an engaging display during the poster session and break time including robots & Eon Reality equipment for conference attendees to try out.

CONGRATULATIONS TO OUR WINNERS:

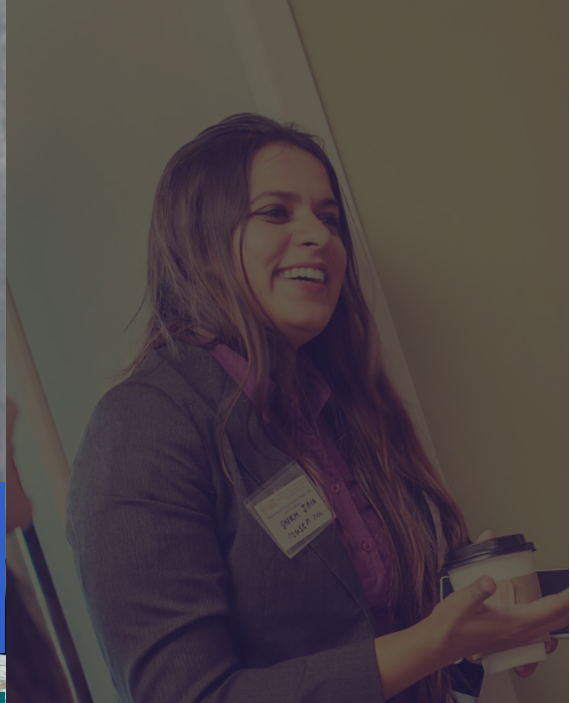
GRADUATE

- 1st: Gourav Singhal
- 2nd: Akarsh Kosuri
- 3rd: Amy Wong

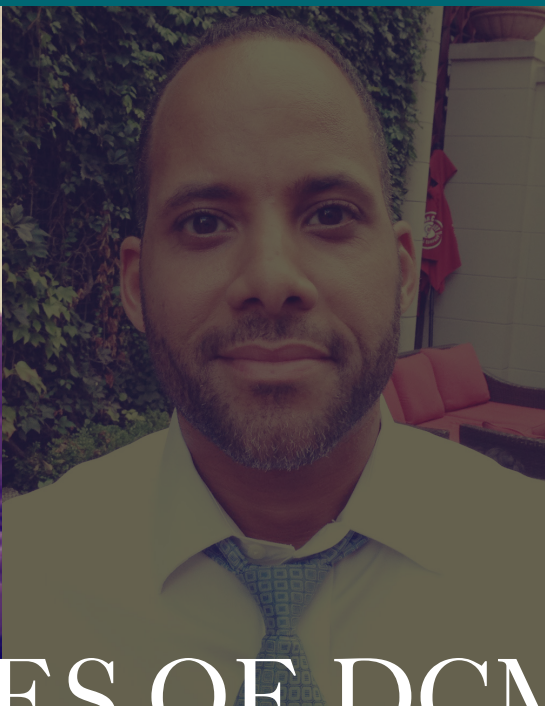
UNDERGRADUATE

- 1st: Alekhy Surepeddi



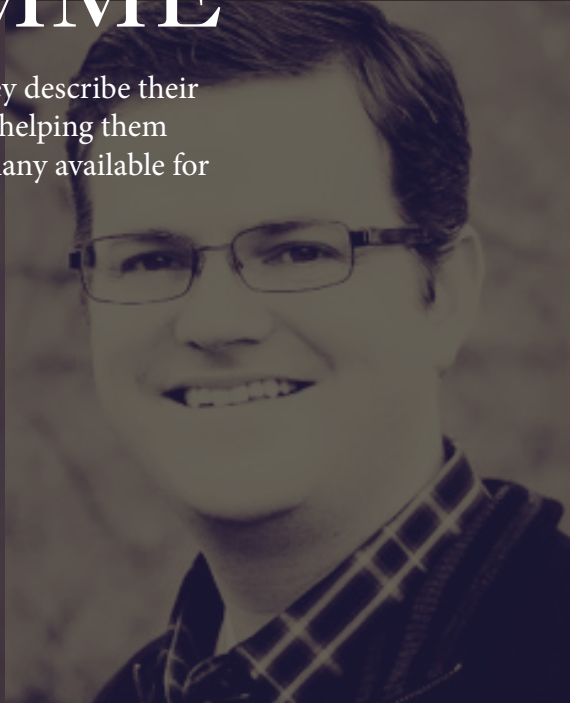
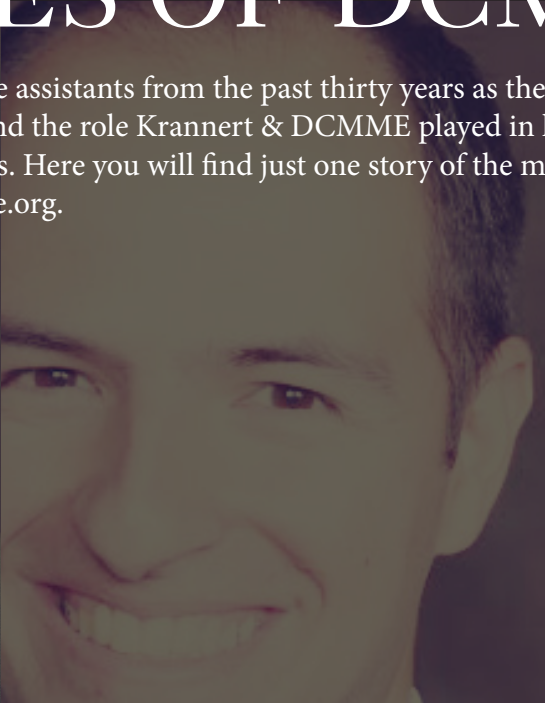
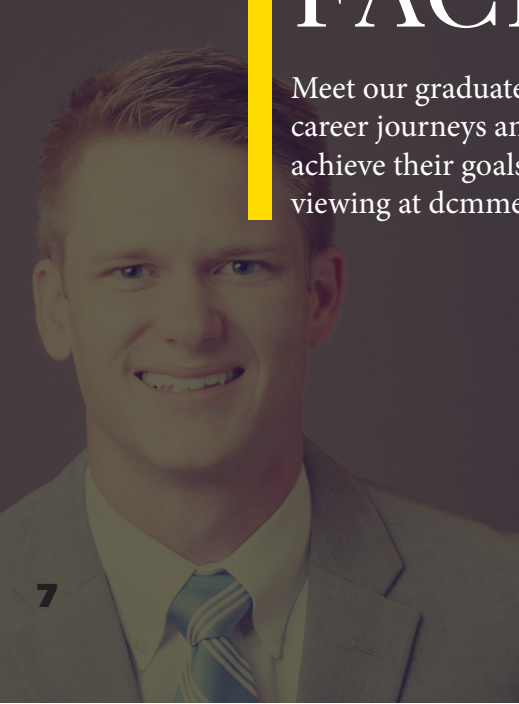


Andrejs Strateicuks
MBA 2014



FACES OF DCMME

Meet our graduate assistants from the past thirty years as they describe their career journeys and the role Krannert & DCMME played in helping them achieve their goals. Here you will find just one story of the many available for viewing at dcmme.org.





DCMME EXPERIENCE TRANSLATES TO CAREER IN EUROPE

Andrejs Strateicuks calls his experience at Krannert and DCMME a “very positive time and an important step in my life.”

He remembers all the nights he spent studying in Rawls Hall with *“wonderful and accomplished people from all over the world who all came to West Lafayette for one reason: to get great education.”*

DCMME provided an important link between what he and other students learned in the classroom and the business world they aspired to join. Through conferences, poster and case competitions, and other events organized by the center, students were able to meet and learn from business people in different companies and industries.

“This was as important to our professional development as the studies itself,” he said.

As a graduate assistant at DCMME in the 2013/14 academic year, he was involved in organizing conferences and other events. “This was a new experience to me, as I had to cooperate not only with my colleagues and other students, but also with industry people of different ranks,” he said. The experience

has been helpful in his career, especially in his former role as CEO of the Latvian Alcohol Industry Association, which required him to work daily with politicians, state officials and leading business people. Last year, he joined Amazon Transportation Services Europe and continues to benefit from his DCMME experience.

“Working in Europe means dealing with different rules, regulations and mentality of the people, thus the experience from Krannert and DCMME with all its diversity is still very valuable to me,” he said. Strateicuks, who earned his MBA in 2014 and also has a PhD in economics from University of Latvia, has served as deputy chairman of the Board of Trade in the Latvian Chamber of Commerce and Industry for the last three years. “We never know where our life will bring us in the future, but I can truly say that Krannert and DCMME have helped me to become who I am today and I am very thankful for that,” he said.

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VIEW CENTER'S 30 YEAR TIMELINE AT DCMME.ORG INCLUDING PHOTOS AND VIDEO INTERVIEWS

the key to any successful endeavor...

THE COURAGE TO LEAD

Dauch: manufacturing a leader

Purdue and the Krannert School founded our center in 1987 initiated with grants from Ameritech, Chrysler, Ingersoll Rand, Hillenbrand Industries, and TRW to help produce technically sound, globally aware professionals and academicians to enhance our country's global manufacturing competitiveness. DCMME has remained active in ensuring that the manufacturing management curriculum addresses today's and tomorrow's issues and prepares our students to devise tomorrow's solutions. DCMME is a leader in training people in the skills necessary to lead manufacturing organizations in the future. In the fall of 1998, the Krannert School announced the naming of the Dauch Center for the Management of Manufacturing Enterprises in honor of the Richard E. Dauch family. Richard E. Dauch, a 1964 graduate of the Krannert

School, provided the vision and was a driving force in the creation and philosophy of the then-named Center for the Management of Manufacturing Enterprises in 1988. He encouraged a \$1 million gift from Chrysler to help found the center. Dauch was the chairman, CEO, and president of American Axle & Manufacturing before his passing in 2013. Dauch was recognized as a manufacturing strategist with an estimable career in the automotive industry. He was recruited from VW by Lee Lacocca to jump-start Chrysler's manufacturing operations. In 1994, Dauch and other investors purchased the axle, forge, and prop shaft business from GM to create American Axle & Manufacturing. Dick Dauch's managing style was represented by one of his favorite quotes seen in his office: "The One Who Says It Cannot be Done Should Never Interrupt the One Who is Doing it." Dauch played for legendary football coach Jack Mollenkopf. Dauch married his high school sweetheart, Sandra Rule, and they left Purdue University in 1964 with their two sons, Rick and David. Dauch has been very generous to his alma mater. Beyond providing the Chrysler grant that was instrumental in the creation of the Center, he and Sandy have pledged millions of dollars to Purdue and Krannert through the years. "Through Dick Dauch's vision and leadership, his passion, drive, determination, commitment, and sacrifice, he has made great contributions to the field of manufacturing and manufacturing education. Our center wouldn't be here without him." (Herb Moskowitz, DCMME Director 1991-2004)





**“AT TVS,
CLASS-LEARNED
OPERATIONS
CONCEPTS COME
TO LIFE.”**

-DENNIS HERNANDEZ, MBA 2017



In March, as powder color soars through the air for the celebration of the Indian Holi Festival of Color, a group of Krannert students looks forward to globalizing their resumes in India just a few weeks later.



TVS INDIA INTERNSHIP

The TVS India Internship organized by the DCMME Center in conjunction with the TVS Motor Company was developed in 2006. Providing a unique study abroad internship opportunity in Bangalore, India, this trip assists students in developing a global business perspective while enhancing their resume profiles. TVS is a Deming Prize winning two-wheeler manufacturing company producing motorcycles, scooters, and mopeds. TVS has been credited with many innovations in the Indian automobile industry, notable among them being the introduction of India's first two-seater moped. Krannert alumnus Venu Srinivasan (MSM '77) is the chairman and managing director of TVS Motor Company. Participants have a distinctive occasion to take concepts learned in the classroom and apply them to real life business situations. The

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TVS was **the highlight of my Krannert Life.**

I learned strategic planning as well

as operational execution. It was an amazing opportunity to apply my knowledge from Krannert and solve real world challenges,” says Hyejin Kim, MBA 2017. This innovative and challenging global program is celebrating 11 years with a total of 146 students having participated, represented by



MBA, MSHRMs, and engineering students. Work on this three credit course begins in mid-February when students begin communication with their mentors. Discussions with their mentors regarding project objectives and completion of research pre-departure for India help to ensure a productive and successful internship for everyone involved. The course culminates in May with a three week visit to Bangalore, India where students continue work

on their projects with TVS mentors and present their final work to TVS Company representatives. The internship lasts three weeks ending after final presentations to management on the final day. Students receive intimate exposure to TVS Motors and its strong culture through presentations and discussions from company leadership, a plant tour, and a visit to one of their corporate social responsibility villages. TVS also ensures that students get a taste of Indian culture outside of the office by coordinating dinner for the students to meet with various Indian families in their homes as well as provide an evening of classical Indian music and dance.

“Bangalore is a vibrant city,”

Dennis Hernandez, MBA 2017. A weekend trip to the Taj Mahal is yet another highlight to the trip. TVS arranged a visit to the beautiful Bangalore Infosys campus where students learned about how the company develops its human talent. Mason Preusser, MBA 2017 reflects on the company exposure during the trip, “My internship at TVS granted me irreproducible insight into how companies work overseas.



CENTER PROJECTS OVERVIEW BRIDGING INDUSTRY, STUDENTS, AND FACULTY.

Over the years, projects have been a main stay of the Center’s activities. Projects have been used to educate our students, provide data for research and scholarly papers, and a source of funding for the center. We are following in these

Both the exposure to consumer sentiment and business culture in India are invaluable assets."

TVS selects their projects primarily based on meaningful work product. Part of the success of the program rests on the fact that students are aware that the consulting projects carry great importance to the firm, and if done well, they will likely become part of an adoption and implementation strategy. The projects that the firm ultimately offers tend to have a unique balance of the following qualities: analytical complexity, urgency for resolution, lack of available resources to assign internally, and a desire to test a current business situation against international best practices. Projects cover many different management areas including Operations and Supply Chain Management, Human Resources Management, Sales, and Management Information Systems, naming just a few. Deron Leslie, MBA 2017, sums up the trip- "The TVS

Motors Internship in India gave me **a new, refreshing perspective on friendship, culture, global industry and life in general"**



My internship at TVS granted me irreproducible insight into how companies work overseas.

-Mason MBA 2017

same footsteps with a heavier emphasis on both short and long term projects. Currently we have projects covering such topics as: manufacturing floor space allocation, divisional or company consolidation, supply chain in both internal and external areas, and manufacturing

and supply chain technology integration. Industry types include manufacturing, medical, start-ups, and non-profit organizations, each with unique and varying scopes. In many cases these projects result in a technical speaker for one of our yearly conferences.





A special **thank you** to all who contribute to scholarship funding for our students.

As stated by Richard Dauch, Co-Founder American Axle & Manufacturing (AAM), Purdue alum and generous benefactor of the Center, "We know that competition on a global scale will require the best we have to offer. The same is true for educating our future manufacturing leaders and encouraging innovation in manufacturing and technology research."

STUDENT SCHOLARSHIPS

Through the generous sponsored scholarships provided by our industry partners, students who express sincere interest in supply chain management and manufacturing management can benefit from Krannert's highly regarded undergraduate and MBA programs.

JOHN DEERE

Marquette Minner
Richard Luan-Jimenez
Darren Young

SUBARU ISUZU SCHOLARSHIP FELLOWSHIP

Collin Taylor

MAPLE LEAF FARMS SCHOLARSHIP

Cline, Linnea N.
Brumfield, Benjamin D.
Chackochan, Oswin P.

ENSIGN BICKFORD MANUF. ENDOW

Alexandra Rocholl-Werner

STUDENT SCHOLARSHIP RECIPIENTS: Marquette Minner, Richard Luan-Jimenez, Darren Young, Jessica Miller, Blake Mawhorter, Alexandra Rocholl-Werner, Collin Taylor **STUDENT GSCM & MTM OPTION CERTIFICATE RECIPIENTS:** Gustavo A. Acosta, Othman Alkharraz, Ignatius Arthur Rajvir Singh, Egel Ben-Marvin, Chien Wen Cheng, Prasenjit Datta, Rewat Singh Fageria, Jacob C. Haury, Jonathan Henry, Dennis Hernandez, Justin Hodapp, Ashwini Jain, Glen Mishal John Kennady, Thomas J. Kappock, Hyungrok Lee, Philip D. Lemperle, Deron Leslie, Gokulkannan Madhusundararaju, Hideto Mitsuoka, Garima Namdeo, Nikhil Pallavali, Kramer M. Phalen, Abhinandan Rangappa Lakshmana, Braulio Rodrigues, Mohit M. Sahu, John M. Scott, Sayan Sinha, Lamis Sleiman, Alexander Sterdjovich, Viren Tulsian, Krisli Vasili, Cherukuri VDS Chowdary, Shruti Vishwakarma, Zheng Wang, Justine Weatherman, Ruoxin Wu **TVS STUDENT INTERNS:** Mike Hanson, Sheldon Anderson, Adam Myers, Alphonso Myers, William Harbert, Sarinah Marie Narciso, Christina Rasquinha, Katie Mullen, Sharanya Madhavan, Yating Fang, Hannah Little, Shree Frazier, Shea Thomas **STUDENT PROJECT TEAM:** Vibhav Mishra, Yash Ambegaokar, Shounak Joshi, Satwik Kulkarni, Rushabh Banthia, Sushant Bhat, Rong Liao, Taeyong Kim, Kalyan Sashank Mupparaju, Manita Dagar, Humphrey Kanyoke, Matt Foust, Shashank Chinnolla, Jerry Jana, Amitesh Mishra, Claire Conneely, Anand Deshmukh, Pekham Dey, Taylor Haws, Matt Jung, Kristine Kim

student involvement

(FROM TOP,
LEFT TO RIGHT)

GEMMA BERENGUAR

TOM BRUSH

SURESH CHAND

AMY DAVID

ANNABELLE (QI) FENG

GREG HUNDLEY

ANANTH IYER

JUSTIN JIA

KARTHIK KANNAN

ELLEN KOSSEK

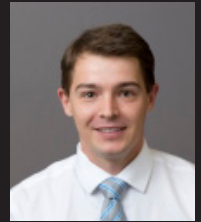
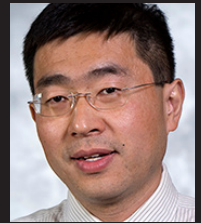
YANJUN LI

YAROSLAV ROSOKHA

OLGA RUSYAEVA SENICHEVA

GEORGE SHANTHIKUMAR

SUSAN WATTS



KRANNERT FACULTY

We are grateful to the many faculty at Krannert who participate in Center sponsored events, projects and research. Thanks to each one for their efforts to progress the scholarly works in Operations and Global Supply Chain Management.

current center staff



ANANTH IYER
DIRECTOR, DCMME

aiyer@purdue.edu
Department Head, Management
Susan Bulkeley Butler Chair in
Operations Management



STEVEN DUNLOP
MANAGING
DIRECTOR, DCMME

dunlops@purdue.edu



HEIDI ALLWES
CENTER
COORDINATOR

hallwes@purdue.edu



DAUCH CENTER FOR THE MANAGEMENT
OF MANUFACTURING ENTERPRISES