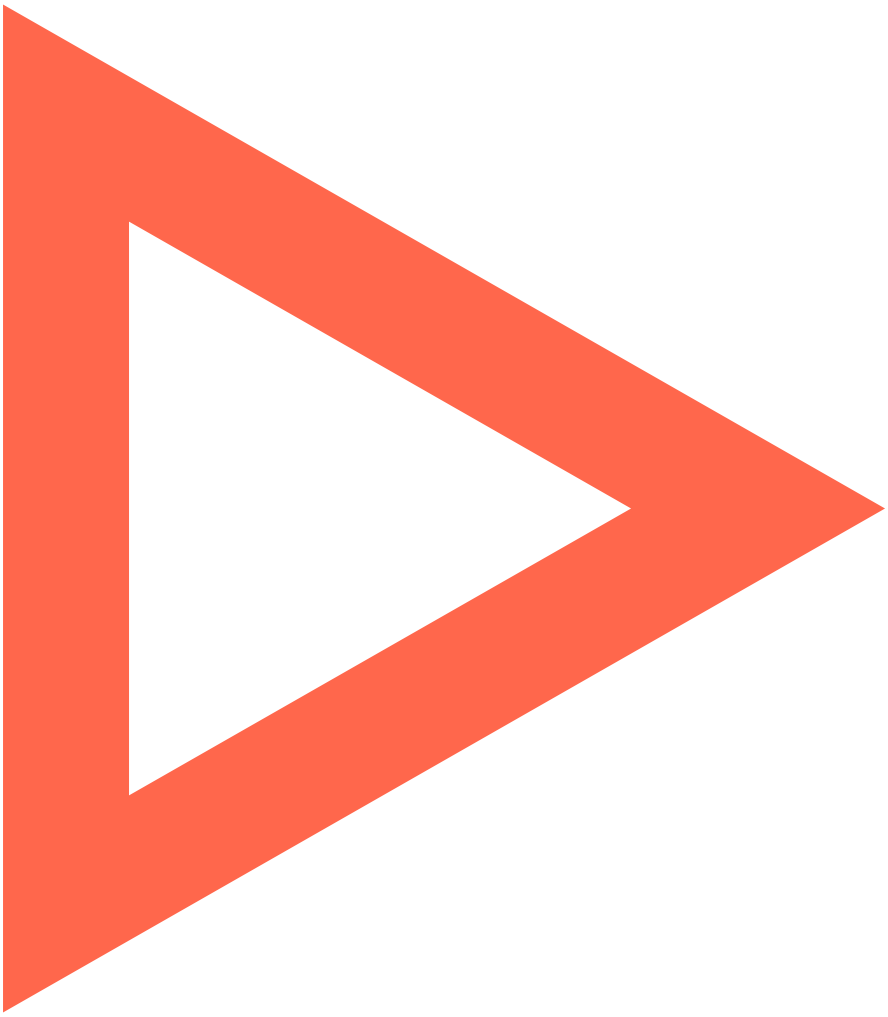
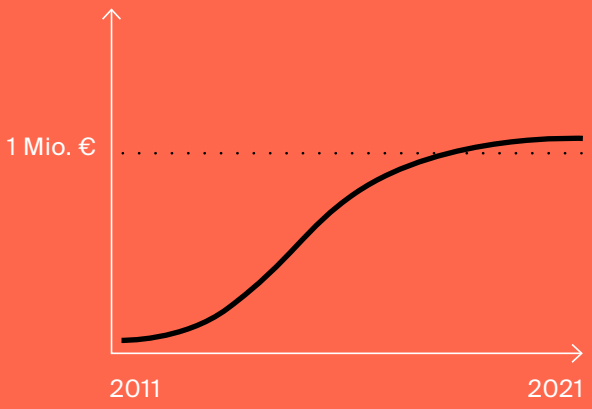


IIM REPORT 2011-2021

10 YEARS OF INNOVATION

Third-party revenues

Total per year

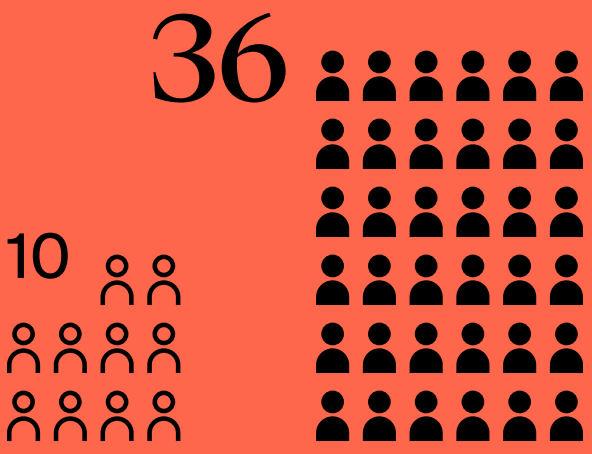


Split industry vs. public 2011-2021

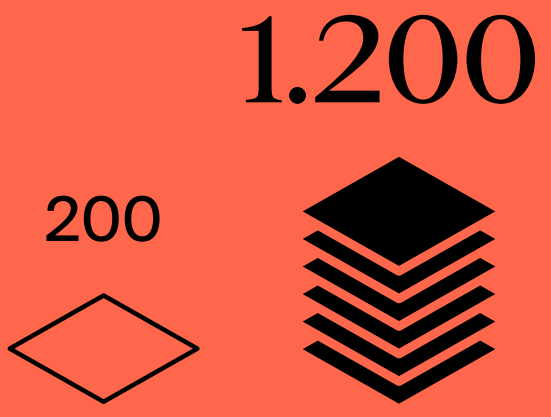
15%
Public

85%
Industry

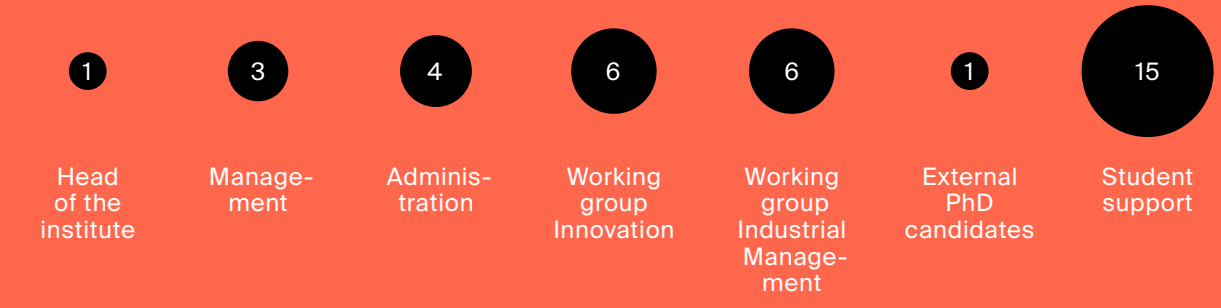
Team members



Space for offices and laboratories (m²)



Team composition



Product Design at the Schumpeter Laboratory for Innovation

>1.600
members
registered at the FabLab Graz

>3.500
hours of laser cutting

18
3D Printers

>1.700
hours of CNC milling

>31.000
hours
of 3D printing

62
products
developed and 7 patents filed by our industry partners

Our students

>50
different nationalities attended our courses

>10.600
registrations for our courses

30%
female
students in our university course Product Innovation Project

Our guests

52
invited guest speakers
held lectures in our courses

13
international professors
visited our institute

Courses and theses

>468
university courses offered

>144
MSc theses
completed

13
PhD theses
completed

54
BSc theses
completed

Teaching at the LEAD Factory

>620
participants trained in our LEAD Factory

>1.250
scooters
assembled in our LEAD Factory

WELCOME

PROF. CHRISTIAN RAMSAUER

Serving as the head of the Institute of Innovation and Industrial Management (IIM) at Graz University of Technology (TU Graz) for ten years has been a remarkable experience. I am now pleased to share this IIM Report with you and show more detailed insights on what we have achieved between 2011 and 2021.

This report focuses on what matters most: WHO WE ARE and WHAT WE DO. The first part deals with information on our people – a truly outstanding team, the new facilities we operate and the great partners we collaborate with. In the second part, an overview of our expertise in research and teaching is provided, and different options for industrial collaborations are explained. Finally, a comprehensive summary of our work and activities is given.

We are looking back to 10 YEARS OF INNOVATION and are excited about all the new ventures ahead. Join us on our journey. I am looking forward to meet you.

WHO WE

ARE

WHO WE ARE

ABOUT

Schumpeter Laboratory for Innovation
Inffeldgasse 11 / III, 8010 Graz

Main location
Kopernikusgasse 24 / II, 8010 Graz

The Institute of Industrial Management and Innovation Research (IBL) was established in 1970. Prof. Hans Hinterhuber was the first head of the institute followed by Prof. Walter Veit (curator) in 1975 and Prof. Josef Wohinz in 1979. In 2005, Prof. Wohinz became head of the new Institute of Production Science and Management (PSM) which was founded in cooperation with Magna International Inc. at Graz University of Technology.

Since 2011, Prof. Christian Ramsauer is the head of both institutes and has initiated an expansion in personnel and office space. The name of the institute was changed to Innovation and Industrial Management (IIM) in 2017 and at the same time, the Institute of Production Science and Management was fully integrated.

The IIM is one of 18 institutes of the Faculty of Mechanical Engineering and Economic Sciences at Graz University of Technology. The institute offers more than 30 courses for Bachelor, Master and PhD students. Besides university staff, many external lecturers from industry teach our students. Currently, 90% of all courses are taught in English, which attracts many international students especially from the Erasmus+ program but also from outside of Europe.

The institute operates the IIM Seminar Room, the Schumpeter Laboratory for Innovation and the LEAD Factory. The IIM Seminar Room, with a capacity of 39 seats, is a replica of the original Harvard Business School case study rooms and mainly used for case study teaching. The institute is organized in two working groups. The working group Innovation is located at Inffeldgasse 11 and operates the Schumpeter Laboratory for Innovation including the FabLab. The working group Industrial Management is located at Kopernikusgasse 24 and runs the LEAD Factory.

Research and teaching focuses on topics related to the product creation process from the product idea to production covering four main areas: Agility, Efficiency in Operations, Product Design and Maker Movement.

WHO WE ARE

PEOPLE

HEAD OF THE INSTITUTE

Prof. Christian Ramsauer

PROFESSORS

Prof. Josef Wohinz
Emeritus

Prof. Hans Heinz Danzer

Prof. Josef Spitzer

MANAGEMENT

Dr. Hans Peter Schnöll
Deputy head of the institute and head of working group Innovation

Dr. Hugo Karre
Head of working group Industrial Management

Dr. Matthias Wolf
Assistant Professor

ADMINISTRATION

Daniela Neukam

Jasmine Sagrando

Theresa Huber

Philipp Rouschal

WORKING GROUP INNOVATION

Andreas Kohlweiss
University Assistant

Marion Unegg
University Assistant

Patrick Herstätter
Project Assistant

Oliver Moerth-Teo
Project Assistant

Lukas Kreilinger
Workshop Manager FabLab

Manuel Lesser
Project staff

WORKING GROUP INDUSTRIAL MANAGEMENT

Maria Hulla
University Assistant

Atacan Ketenci
University Assistant

Kai Rüdele
University Assistant

Elias Auberger
Project Assistant

Heimo Preising
Project Assistant

Florian Kulmer
Project Assistant

EXTERNAL PHD CANDIDATES

Nils-Christian Böhnke
Industrial Management, Project partner: BMW Group

STUDENT SUPPORT

Markus Althuber

Benjamin Bek

Felix Brückl

Daniel Gutmann

Amina Krdzalic

Alexander Lang

Klaus Leitgab

Martina Miskovic

Christoph Pirklbauer

Marvin Rantschl

Christoph Reichinger

Markus Ritter

Maximilian Saiko

Noel Scheder

Florian Strobl

Dr. Christian Rabitsch
Dr. Mario Kleindienst
Dr. Hans Peter Schnöll

Prof. Viktor Mayer-Schönberger

ALUMNI

PhD graduates

Dr. Wolfgang Unzeitig	AVL List GmbH
Dr. Matthias Schurig	Check24 Vergleichsportal GmbH
Dr. Christian Rabitsch	WILD Gruppe
Dr. Mario Kleindienst	MSG Mechatronic Systems GmbH
Dr. Markus Hammer	McKinsey & Company
Dr. Stefan Heldmann	McKinsey & Company
Dr. Thomas Böhm	Knapp AG
Dr. Alexander Pointner	Eppendorf AG
Dr. Martin Kremsmayr	Boston Consulting Group
Dr. Matthias Friessnig	Siemens AG

PhD graduates (Prof. Wohinz)

Dr. Sonja Embst	Tianjin Electric Power Construction
Dr. Verena Kriegl	Verena Kriegl Fotographie
Dr. Nikolaus Mitterer	Knapp AG
Dr. Georg Premm	BMW AG
Dr. Elisabeth Winkler	Miba AG

Former student support

- Fridolin Bachlechner
- Cora Christian
- Matthias Eder
- Sascha Josef Gotthardt
- Alexander Hehenberger
- Christian Jungmair
- Martin Jungreithmair
- Berker Kantar
- Maximilian Karre
- Melanie Leopold
- Andreas Lukas
- Felizian Mast
- Jürgen Neubauer
- Stefan Obermoser
- Thomas Gerhard Pickl
- Christian Pointner
- Michael Rossmann
- Elma Alexandra Sadaj
- Lukas Schwarz
- Edmira Shqau
- Laura Thaci
- Paul Till
- Fabian Luca Urlicic
- Felix Wieberneit
- Thomas Wildbolz

EXTERNAL LECTURERS		Course
Günther Apfalter	Magna International Europe AG, Magna Steyr AG & Co KG	Management Topics in Automotive Industry
Dr. Clemens Arth	ICG, TU Graz	Product Innovation
Raimund Diederichs	McKinsey & Company	Manufacturing and Supply Chain Network
Stefan Doblhofer	Mag. Stefan Doblhofer Unternehmensberatung	Change Management
Dr. Helmut Rupert Egger	Baxter AG	Safety and Sustainability
Maria Gabriele Ferrufino Vidal	Hollenstein Group	Leadership and Motivation
Peter Haidl	EMT, TU Graz	Product Innovation
Dr. Stefan Hauswiesner	Reactive Reality	Product Innovation
Dr. Markus Hammer	McKinsey & Company	Learning Factory
Robert Hammer	Knapp AG	Warehouse Logistics
John Heugle	Mitra Partners Inc.	Safety and Sustainability
Dr. Hannes Hinterbichler	Fronius Austria GmbH	Product Innovation
Franz Kero	Magna Steyr AG & Co KG	Management Topics in Automotive Industry
Alexander Kienreich	McKinsey & Company	Design to Value
Brigitte Kroll-Thaller	General Motors Europe	Marketing in Automotive Business
Dr. Werner Leitner	Successfactory Management Coaching GmbH	Quality Management, Teambuilding
Georg List	AVL List GmbH	Implementing Innovation Strategy through Merger and Acquisition
Dr. Peter Mohr-Ziak	ICG, TU Graz	Product Innovation
Dr. Manfred Ninaus	VMN – Valuemanager Ninaus GmbH	Product Innovation Management, Value Management
Dr. Hannes Oberschmid	BDO Austria	Operational Risk Management
Roberto Piccioni	UC Berkeley Extension Center	Safety and Sustainability
Dr. Alexander Pointner	Eppendorf AG	Production Strategies
Bernhard Reisner	Miba AG	Teambuilding
Dr. Gernot Riesenhuber	AUVA Allg. Unfallversicherungsanstalt	Work Safety
Prof. Karl Rose	Abu Dhabi National Oil Company	Energy Management
Dr. Andreas Stugger	PIA Automation	Operational Risk Management
Dr. Markus Tomaschitz	AVL List GmbH	Leadership and Motivation
Vladimir Valastiak	Miba AG	Quality Management
Volker Warzecha	VGW GmbH, SICA Vermögensverwaltung KG	Implementing Innovation Strategy through Merger and Acquisition
Leonhard Weingrill	IMAT, TU Graz	Product Innovation
Mathias Weyrer	Conecta GmbH & Co KG	Career Management
Dr. Roland Winkler	AT&S	Product Innovation Management
Prof. Siegfried Wolf	Steyr Automotive	Management Topics in Automotive Industry
Dr. Liselotte Zvacek-Schrefel	17&4 Organisationsberatung GmbH	Change Management

GUEST SPEAKERS

		Course
Dr. Hannes Androsch	former Federal Minister of Finance	Leadership and Motivation
Christoph Bistricky	Magna International Europe AG	Management Topics in Automotive Industry
Dr. Jörg Blechinger	Blechinger Supply Chain Solutions	Logistics Management
Walter Brabek	Nidec Global Appliance	Creativity Techniques
Dr. Roland Busch	Siemens AG	Production Strategies, Product Innovation
Andy Cavatorta	American sculptor	Enabling Innovation
Jordi Closa Guerrero	adidas Group	Keynote speech at the 3rd MI&R Partner Meeting
Walter Degen †	Degen Top	Value Management
Hans Ehm	Infineon Technologies AG	Logistics Management
Manfred Eibeck	Russian Machines Corporation	Management Topics in Automotive Industry
Mario Fallast	smaXtec animal care GmbH	Creativity Techniques, Product Innovation
Markus Flasch	BMW AG	Management Topics in Automotive Industry
Prof. Johann Füller	University of Innsbruck	Product Innovation Management
Prof. Hannes Hick	IME, TU Graz	Product Innovation Management, Enabling Innovation
Jürgen Haßler	Komptech GmbH	Value Management
Clemens Honeder	Miba AG	Industrial Engineering
Gerald Hörhan	Investment Punk	Product Innovation
Dr. Roswitha Hosemann	AUVA Allg. Unfallversicherungsanstalt	Work Safety
Julia Jantschgi	ICG Integrated Consulting Group GmbH	Product Innovation
Jürgen Jantschgi	Jantschgi C&R	Enabling Innovation
Dr. Gerald Jaritz	Steirerbiene und Schubkraft Team- und Organisationsentwicklung	Value Management, Enabling Innovation
Prof. Thomas Krautzer	Institute of Economic, Social and Business History, Universiy of Graz	Enabling Innovation, Production Strategies
Dr. Robert Kremlicka	A.T. Kearney GmbH	Management Topics in Automotive Industry
Otmar Kühner	REA Research	Enabling Innovation
Prof. Peter Kuhlang	Deutsche MTM-Vereinigung e. V.	Industrial Engineering
Dr. Kurt Leodolter	AUVA Allg. Unfallversicherungsanstalt	Industrial Engineering
Burton Lee	Stanford University	Product Innovation
David Li	Shenzhen Open Innovation Lab	Product Innovation Management
Adolf Mehlmauer	Österreichisches Patentamt Wien	Enabling Innovation
Dr. Peter Mitterbauer	Miba AG	Management Topics in Automotive Industry
Andreas Neureiter	AUVA Allg. Unfallversicherungsanstalt	Work Safety
Karl Nigl	Magna International Europe AG	Management Topics in Automotive Industry

Thomas Platzer	AVL List GmbH	Product Innovation Management, Enabling Innovation
Stefan Posch	ICG Integrated Consulting Group GmbH	Creativity Techniques, Product Innovation
Patricia Puhr-Zeismann	AUVA Allg. Unfallversicherungsanstalt	Work Safety
Dr. Manuela Redecker	Deutsches Patentamt	Enabling Innovation
Herwig Rollett	Business Angel Institute c/o Venionaire Capital GmbH	Enabling Innovation
Dr. Stefan Röll	Zwick GmbH & Co. KG	Enabling Innovation
Dr. Michael Russ	Ringana GmbH	Industrial Engineering
Gerhard Seiler	VE Expert Network	Value Management
Karl-Friedrich Stracke	Magna Steyr AG & Co KG	Operational Risk Management
Claudia von der Linden	Vice-rector, TU Graz	Change Management
Dr. Roland Waldner	Philips Consumer Lifestyle Klagenfurt	Creativity Techniques
Peter Wanek-Pusset	Innofreight Speditions GmbH	Value Management
Bernhard Weber	Unicorn Graz	Enabling Innovation
Dr. Hannes Weißenbacher	AUVA Allg. Unfallversicherungsanstalt	Work Safety
Ludger Weyers	Magna Steyr AG & Co KG	Product Innovation Management
Dr. Alexander Wiegele	Prozess- & Logistik-Optimierung	Logistics Management
Dr. Alexander Wipplinger	voestalpine Böhler Welding Group GmbH	Enabling Innovation
Lukas Zeni	Innofreight Speditions GmbH	Value Management
Dr. Wolfgang Zitz	CONSIGA & Partner consulting GmbH & Science Park Graz	Operational Risk Management
Hans Ulrich Zöhrer	Siemens AG	Industrial Engineering

INTERNATIONAL PROFESSORS VISITING

Prof. Thomas Berletz	University of Ljubljana (SLO)
Prof. Jochen Deuse	Technical University of Dortmund (GER)
Prof. Kalevi Ekman	Aalto University (FIN)
Prof. Thomas Gries	RWTH Aachen University (GER)
Prof. Cornelius Herstatt	Hamburg University of Technology (GER)
Prof. Viktor Mayer-Schönberger	University of Oxford (GBR)
Prof. Mirko Meboldt	ETH Zürich (CHE)
Prof. Joachim Metternich	Technical University of Darmstadt (GER)
Prof. Iztok Palcic	University of Maribor (SLO)
Prof. Frank Piller	RWTH Aachen University (GER)
Prof. Robert Schmitt	RWTH Aachen University (GER)
Prof. Marco Sortino	University of Udine (ITA)
Prof. Stefan Thomke	Harvard Business School (USA)

FACILITIES

Prof. Christian Ramsauer has started several initiatives to support participant-centered learning and applied research. In 2015, the IIM Seminar Room was established in order to support the Harvard case study teaching method. The LEAD Factory was opened in 2014 to support education and research in the fields of industrial management by enabling hands-on experiences. The FabLab and the DesignLab have been operated since 2014 to support students and makers to work on and build new products and services.

Since 2018, the Schumpeter Laboratory for Innovation is the home base of the working group Innovation and covers the functions of the former DesignLab and FabLab at an advanced level. Covering an area of more than 800 m^2, the Schumpeter Laboratory for Innovation provides a platform for the exchange and networking of makers, industry and university research.

IIM SEMINAR ROOM

–

Harvard case study teaching

SHORT INFO

What is the IIM Seminar Room?

The IIM Seminar Room is designed to fulfill the requirements for practicing the Harvard case study method in teaching.

What is the Harvard case study teaching method?

It is an instructor-guided, discussion-based form of teaching. Based on real-life problem scenarios the students act together to advance their individual learning.

Offering

Companies can rent the IIM Seminar Room for workshops, trainings and meetings depending on availability.

"Excellent acoustics and spatial organization of a room is half the success of the Harvard case study teaching method. Time in the classroom should be characterized by an atmosphere that can be translated directly into real life."

Prof. Stefan Thomke,
Harvard Business School

THE DESIGN

The IIM Seminar Room is designed in a U-shape that supports open communication. The seating rows are graded in height and enable every contributor to take part in discussions. Further, the spatial design ensures that everyone has an overview of the whole room. Excellent acoustic is the key to a great learning experience. The air-conditioned room with a capacity of 39 seats is equipped with 9 blackboards, two projectors and full video conference capabilities.

WHAT IS CASE STUDY TEACHING?

The case study teaching method is an instructor-guided, discussion-based teaching and learning approach. The cases introduce complex and often ambiguous real-world scenarios, typically with a protagonist facing an important decision. Students receive the case before the in-class discussion and have to prepare it in a first step individually. In a second step, they are discussing the case in small learning groups of four up to six students. The most important part is the participation of the contributors in an 80 min. class discussion, guided by the instructor.

THE LEARNING EXPERIENCE

By practicing case studies, students advance their own learning and that of their classmates. Ideally, learning should continue after class as students reflect on the discussion and apply insights and lessons in the broader context of their academic, professional and personal lives.

WHY DOES THE INSTITUTE OPERATE A "HARVARD ROOM"?

During his post-doc as a visiting scholar at the Harvard Business School in Boston (1997-1999), Prof. Christian Ramsauer experienced the power of the case study method in the MBA program. Encouraged by Harvard Business School Prof. Stefan Thomke, he introduced the case study method as the main teaching method when he became a professor in 2011. After two years of construction work, Prof. Stefan Thomke visited the institute and opened the new room, teaching the "Apple" case in 2015. The case study teaching method was introduced at the Law School of Harvard University in 1870 and the Business School followed 50 years later. Nowadays, HBS is the world's largest publisher of case studies, selling them all over the globe.

LEAD FACTORY

–

First learning factory in Graz

SHORT INFO

What is the IIM LEAD Factory?

The IIM LEAD (Lean, Energy efficient, Agile, Digital) Factory is a small-scale real-life training manufacturing site that offers easy access to hands-on training experience.

Who can use the IIM LEAD Factory?

The IIM Institute offers courses for students and trainings focusing on the L-E-A-D core topics for industry professionals.

Efficient work involves employing the right methods whether it is on a small or large scale.

Therefore, the institute established a learning factory for the assembly of scooters with industry standard equipment. The LEAD Factory is a miniature industrial manufacturing site containing an assembly line of a market-available product, a scooter. Lectures and workshops at the LEAD Factory provide knowledge on lean management, energy efficiency, agile operations and digitalization.

Participants learn hands-on to turn an inefficient production process into a leaner, digitized, more energy efficient and agile process during our LEAD Factory workshops. The LEAD Factory is equipped with state-of-the-art technologies.

Prof. Christian Ramsauer experienced the power of learning factories for teaching at the Technical University of Darmstadt and the Technical University of Munich and started the initiative right away at the institute.
In 2014, Dr. Markus Hammer, (McKinsey & Company) and Dr. Mario Kleindienst taught the first Learning Factory course with 16 students after three years of development.
In 2018, the LEAD Factory became a member of the International Association of Learning Factories.

In 2020 the 10th Conference on Learning Factories was organized and held online by the Institute of Innovation and Industrial Management. The 11th Conference on Learning Factories took place from 30th of June till the 2nd of July 2021 in Graz and was organized also by the IIM Institute.

HANDS-ON TRAINING IN THE LEAD FACTORY

By assembling the TU Graz scooter in a non-optimized initial state of the learning factory, participants analyze the assembly process and identify first improvements. After short, associated theoretical sessions where the basics of industrial engineering, logistics management, lean production and industrial energy efficiency are taught, participants directly return to the LEAD Factory and implement what they have learned. The aim is to actually build an optimized production line and immediately experience the impact of the learned and directly applied methods. Based on the principle of learning by doing workshop participants gather new and sustainable knowledge and can transfer these capabilities much easier to real-life situations.

LEAD FACTORY AS A RESEARCH PLATFORM

Besides practice-oriented training, the LEAD Factory serves as a research platform for advanced manufacturing technologies and processes. As it is a realistic mockup of an assembly area in a manufacturing company, it is designed to serve as a test-bed for state-of-the-art technologies. The direct impact of such technologies can be experienced in LEAD Factory workshops and participants can then discuss the implications and transferability of these technologies to their own facilities.

SCHUMPETER LABORATORY FOR INNOVATION

–

Working space for creativity and innovation

SHORT INFO

What is the Schumpeter Laboratory for Innovation?

The Schumpeter Laboratory for Innovation is a place for learning, prototyping and exchanging ideas to foster product innovation involving maker, industry and scientific research.

Who can use the Schumpeter Laboratory for Innovation?

Students of our courses and members of our industry partners have access to the Schumpeter Laboratory for Innovation. On Thursday afternoon, after participating in a basic training, the general public can enjoy free access.

The Schumpeter Laboratory for Innovation provides a platform for the exchange of students, researchers, start-ups, SMEs and established industrial companies.

It offers access to the most modern infrastructure – digital production machines, extensive multimedia and communication systems – in order to support the cooperation of involved actors and the resulting product and business model development in the best possible way. Based on the development and implementation of new cooperation models, new strategies for targeted cooperation of the relevant key players are researched and derived. This hotspot for innovation regularly hosts various programs such as makerthons, innovation weeks, training programs and much more.

The Schumpeter Laboratory for Innovation offers opportunities to teach practical skills and applying them creatively. Therefore, it encourages students to freely invent and prototype as in the course "Design Thinking and Rapid Prototyping". By providing access to powerful tools of production within shared spaces and actively connecting the individuals involved, a significant boost in their commitment can be expected. Hands-on training concepts with learning by doing experiences represent an alternative to traditional teaching methods.

The construction work for the additional floor at Inffeldgasse 11 started in July 2017. In September 2018 we got the finished but empty building to create our new academic makerspace which is now home of the working group Innovation. The interior work was completed by November 2018. The official opening of the laboratory took place on April, 25th 2019. The Schumpeter Laboratory for Innovation is divided into different areas including the Fabrication Laboratory I & II (FabLab I & II), the Lobby, the Office Area, meeting rooms (Schumpeter & Tesla) and the DesignLab. ▸

FabLab I & II

DESIGNLAB - THE MULTIFUNCTIONAL AREA

It is the multifunctional area of the Schumpeter Laboratory for Innovation and designed for flexible use. Settings can be easily modified and rearranged for various purposes like lectures, panel discussions, creative work, workshops and social interactions. It is equipped with a high tech 4K LED display wall, highly sophisticated sound, light and video conferencing equipment and offers a capacity for up to 120 people. Besides the regular university use, the flexibility allows hosting different non-university events like music acts, board meetings or product presentations.

Additionally, the DesignLab offers the possibility to arrange moveable workbenches to be used as an extension of the FabLab I & II if needed.

FABLAB - DIGITAL FABRICATION AREA FOR RAPID PROTOTYPING

The FabLab provides easy to use and state-of-the-art digital production machines such as laser cutters, a waterjet cutter, high-resolution CNC milling machines, 3D printers of various technologies, a 3D scanner, a PCB printer and electronic work stations, equipped with everything needed for rapid prototyping.

Every Thursday from 2 pm to 6 pm, the FabLab is available to everyone, not just to students. After being generally trained in safety and organizational issues one just has to bring along own ideas to realize them physically.

LOBBY - SPACE TO EXCHANGE IDEAS AND EXPERIENCES

The Lobby is an essential space at the Schumpeter Laboratory for Innovation. It is a space which encourages open communication and spontaneous encounters. Users of the laboratory are invited to both, work and relax, as this combination is vital to the creative process and performance.

SCHUMPETER & TESLA - STATE-OF-THE-ART MEETING ROOMS

Two meeting rooms, named according to two famous scientists with Graz background, are equipped with interactive touchscreen monitors and video conference equipment to support cooperation by meeting virtually.

PARTNERS

Dr. Markus Tomaschitz (AVL List)
Stephan Zöchling (Remus-Sebring Group)
Dr. Wolfgang Zitz (Magna Steyr)
Johannes Gradwohl (Logicdata)

PROJECT VOLUME > 100.000 EUR

- Andritz AG
- AVL List GmbH
- Elin Motoren GmbH
- Energie Graz GmbH & Co KG
- Fronius International GmbH
- Knapp AG
- Logicdata Electronic & Software Entwicklungs GmbH
- Magna Steyr Fahrzeugtechnik AG & Co KG
- Miba AG
- NXP Semiconductors Austria GmbH
- ÖBB-Technische Services GmbH
- OMV AG
- Orasis Industries Holding GmbH
- Palfinger AG
- Pankl Racing Systems AG
- Payer International Technologies GmbH
- Plansee SE
- Remus-Sebring Group
- Rosendahl Nextrom GmbH
- SFL technologies GmbH
- Ventrex Automotive GmbH
- voestalpine AG
- Wertheim Holding GmbH

20.000 – 100.000 EUR

Albin Sorger “zum Weinrebenbäcker” GmbH & Co KG
Alpen-Maykestag GmbH
AMCS Privatstiftung
Anton Paar GmbH
AT&S Austria Technologie & Systemtechnik AG
Conrad Electronic GmbH & Co KG
Cryoshelter GmbH
Dr. Wolfgang Porsche Foundation
Google Inc.
Hilti Austria GmbH
Infineon Technologies AG
Kendrion Binder Magnete Vertriebs-GmbH
KTM Sportmotorcycle GmbH
Magna International Inc.
Philips Austria GmbH
Porsche Austria GmbH & Co OG
Prof. Siegfried Wolf
REWE International AG
Rosenbauer International AG
Secop GmbH
Styria Media Group AG
TIGER Coatings GmbH & Co. KG
Trotec Laser GmbH
umdasch Store Makers GmbH

< 20.000 EUR

Alstom (Schweiz) AG
AMST-Systemtechnik GmbH
Angst & Pfister AG
Bernegger GmbH
BMW Motoren GmbH
Bosch Mahle Turbo Systems GmbH & Co KG
BRP Rotax GmbH & Co KG
CNH Industrial Österreich GmbH
DKSH Management Ltd.
Ebbinghaus Styria Coating GmbH
Forschungsgesellschaft für Verbrennungskraft-maschinen und Thermodynamik mbH
high-tech-metals Handels- & Fertigungs-GmbH
Hirschmann Automotive GmbH
Innofreight Solutions GmbH
KWB – Kraft und Wärme aus Biomasse GmbH
Liebherr-International Deutschland GmbH
Magna Fuel Tec GmbH
Magna Powertrain GmbH & Co KG
Magna Presstec GmbH
Medienfabrik Graz GmbH
Mercedes-Benz G GmbH
Neurovation GmbH
Pewag AG
Rieper AG
Rolls-Royce Motor Cars Ltd
Schelling Anlagenbau GmbH
Service Technologies GmbH & Co OG
Siemens AG
Statec Binder GmbH
Steyr Automotive
Südflug GmbH
Uddeholms AB
Vaude KG
Voith GmbH
Volkswagen AutoEuropa Lda.
Wild GmbH
wind2power GmbH
Wolfram Bergbau und Hütten AG
Xcessity Software Solutions
ZF Lemförder Achssysteme GmbH

WHAT

WE DO

WHAT MAKES THE IIM SPECIAL?

PhD student Oliver Moerth-Teo in conversation with Prof. Christian Ramsauer about his personal motivation to come back to university and his work at the institute.

Video:
VISION. PASSION. INNOVATION.
IIM at TU Graz

OMT Prof. Ramsauer, in 2011 you followed Prof. Wohinz as head of the institute. A lot has happened since then. How would you summarize the last ten years?

CR The last ten years have been quite turbulent. After working in industry, it was not easy to integrate into the university system with its special rules in the first two years. The most significant challenges were to build up a good team, to raise enough money to gain certain independence and to reduce the lack of awareness among colleagues. So first, I had to find my place in the faculty and establish myself. The first major infrastructure project, the IIM Seminar Room, based on the model of the Harvard Business School, was exceptional for our university. Something has never been built before in Austria. Despite many resistances against the implementation, the rectorate under the leadership of Rector Harald Kainz believed in my initiative. After the successful realization of this project, it has become much easier to find allies for further initiatives both inside and outside the university. Over the past three years, I have gradually arrived at my goal, and we can now drive new initiatives forward.

OMT You have worked in the industry for more than 12 years. Why did you decide to come back to the university as a professor?

CR Two professors who still play an important role in my life today have had a very positive and lasting influence on my path. As a research assistant with Prof. Josef Wohinz, I learned a lot for life and for the first time the idea of returning to the university at the end of an industrial career matured. After this, I was able to learn a lot as a post-doc with Prof. Stefan Thomke at the Harvard Business School. He was my mentor and introduced me to MIT Professor Eric von Hippel (Lead User Innovation). My office neighbors were Clayton Christensen (Disruptive Innovation) and Henry Chesbrough (Open Innovation). All are exceptional authorities on the management of innovation. The fascination of the university never let go of me afterwards. ▶

During my time in industry in various positions, as a consultant at McKinsey & Company, as an entrepreneur and as a managing director in a mechanical engineering company, I was able to gain a lot of practical experience. I got the opportunity to become a professor at Graz University of Technology at the age of 43, much too early for my terms when I was the managing director of a private equity company in Munich.

The decision at that time was money or freedom. I decided for the freedom of teaching and research, for independence and the realization of my own initiatives.

I also knew that it was a rare opportunity to become a professor of innovation and industrial management and I seized it. It gives me great pleasure to pass on my experiences to young people.

OMT What makes the IIM Institute special?

CR From my point of view, what makes the IIM unique is that the institute employs exceptionally talented and ambitious people. I always claim that I have the best employees. My employees form a great team and, in addition to teaching and research, work on various entirely new initiatives. My team truly lives innovation.

With our exciting industry projects, we then attract the best students again, who either become new employees or go into industry and thus support the reputation of the institute.

“my institute employs exceptionally talented and ambitious people”

OMT What is your approach for teaching students?

CR Nowadays, you have to battle for talented students. That’s why we have to give them good opportunities in teaching to convince them about how attractive our topics are. We focus on participant-centered learning. In other words, we try to develop courses in which students are participating in discussions or where they work or do things – it is about “learning by doing”. One example of this is our LEAD Factory, in which students assemble a scooter according to Lean Management principles. This not only makes learning more effective but also lots of fun.

OMT Over the last few years, you have established a lot of cooperations with industry. Why is this important?

CR It is essential for several reasons. First, from these collaborations we receive funding to finance other initiatives at the institute. This enables us not only to employ additional people, but also to invest in new infrastructure projects such as the Learning Factory (LEAD Factory), the Schumpeter Laboratory for Innovation, or the IIM Seminar Room. It also means that we become less dependent on university funding. The second point is that by collaborating with the industry, we attract the attention of decision-makers to initiate joint research projects. This enables us to understand which research topics are genuinely relevant for practice.

Another aspect is that we allow our students to be involved in projects in the form of Master or Bachelor theses and thus give them direct access to industrial companies. There is nothing better for a student who is about to graduate and is looking for a job than to come into contact with industrial companies at an early stage. Ideally, an industrial Master thesis will not only complete the degree but also enable a seamless transition into industry.

About three-quarters of our Master’s projects end with the company offering our students a job immediately after graduation. ▸

OMT You have invested in building new teaching and research infrastructure at Graz University of Technology. What motivated you to do so?

CR

Modern infrastructure is very important for both employees and students so that they can develop, learn and fully unfold their potential.

During my appointment interview with Rector Hans Sünkel in 2011, I formulated a learning factory and the Harvard case study teaching method as specific goals.

Our IIM Seminar Room is a detailed replica of the rooms at the Harvard Business School in Boston. A special seating arrangement, special blackboards, and special acoustics contribute to special learning experience when conducting Harvard case studies. Our students highly appreciate this.

In our learning factory, the so-called LEAD Factory, we can translate theoretical learning content into reality. This is made possible by a real assembly line with industry standards. We combine modern teaching methods with industrial practices. The participant gets to know new technologies and concepts through hands-on exercises.

In 2013, I brought a makerspace initiative from the MIT to Graz and started the first FabLab in Austria. Today there is a FabLab in every federal state. From this initiative, our new Schumpeter Laboratory for Innovation has evolved. It is a place where we help our students to understand what entrepreneurship and product development means. Students meet employees from industry and local start-ups. Together we develop product concepts and build functioning prototypes that can then be tested. This is the foundation for innovative products and new companies.

At our institute, students get to know real-world problems but in a risk-free environment. This prepares them for their daily tasks in industry later on.

OMT In 2020, there was the 50th birthday of the institute. Where do you see your organization in the coming years?

CR First of all, I would like to say that I took over an excellently positioned institute from my predecessor Prof. Josef Wohinz, who headed the institute for more than 30 years. It was this high level that enabled me to launch my numerous initiatives. These initiatives will be able to really unfold in the coming years. The Schumpeter Laboratory for Innovation opened in April 2019 as our third and for this time being last major infrastructure project. It will need some time before its full impact becomes visible. This also applies to the LEAD Factory, which with its new focus on agility and digitalization will enable a new level of knowledge transfer. I see a promising future and many opportunities, especially with our industrial partners, to explore new paths together.

We hosted the first international academic conference in the history of the institute in 2020 – the 10th Conference on Learning Factories. The institute will continue to develop its research through upcoming international conferences in the coming years.

OMT What motivated you to bring these conferences to TU Graz?

CR First, you have to be patient and wait until you are able to organize such a conference. And you have to be perceived as a trusted partner in the research community. These conferences will help us to formulate new goals for our research activities, thereby bundling research capacities and creating new projects. This keeps the research wheel going.

OMT Are you also planning a stronger focus on digitalization?

CR We have already started several digitalization projects with other institutes at TU Graz. For the first time, I hired a new employee with industrial experience in this field. I expect that this will enable us to make digitalization even more useful for our students and our industrial partners through Bachelor and Master projects, and cooperation with other institutes. The best example is the digitalization of our LEAD Factory, which is progressing very well. We can already offer digitalization training for students and participants from companies.

OMT If you could pass one thing to your students on their way, what would that be?

CR Students need visions and self-confidence. If they are focused and passionate about their goals, they can achieve almost anything. It is close to my heart to support them.

URGENT HELP IN THE PANDEMIC: COVID-19 TASK FORCE INDUSTRY

Georg Knill
Barbara Eibinger-Miedl
Harald Riedlhuber
Michael Viet
Hermann Schützenhöfer
Julia Knapitsch
Sebastian Kurz

“Extraordinary situations require extraordinary measures”

according to this saying, the IIM Institute acted in times of the COVID-19 crisis. Prof. Christian Ramsauer and John Heugle (former CEO of ams AG) launched a call to Austrian companies with the aim to help medical staff quickly and non-bureaucratically.

Lack of protective clothing

Due to the rapidly increasing number of COVID-19 patients in March 2020, it was already foreseeable that medical protective equipment would not be available in sufficient quantities (e.g. FFP2/FFP3 safety masks, overalls and face shields). In cooperation with KAGes (Steiermärkische Krankenanstaltengesellschaft m.b.H.), Prim. Dr. Klaus Vander (expert for hospital hygiene) and the head of the intensive care unit of Anaesthesiology at the LKH Graz, Prof. Philipp Metnitz, the IIM COVID-19 face shield was developed. Furthermore, urgently needed protective clothing was handed over directly to the KAGes by industrial partners such as ams AG, AT&S and BWT.

Collaboration with the Ministry

Driven by the initial success and IIM contacts in Vienna, the Federal Ministry of Digitalization and Economic Affairs became aware of the initiative. On April 3rd, Federal Minister Dr. Margarete Schramböck officially announced the COVID-19 Task Force Industry, headed by Prof. Christian Ramsauer and John Heugle. In a first virtual kick-off meeting, executives from 17 well-known Austrian industrial companies (including e.g. ams AG BWT, Payer Medical, Hage, Ortner, VTU, Saubermacher, Fronius, Siemens, Magna, Orasis and many more) participated.

Focal Points

In order to provide the best possible support to national decision-makers, following focal points, among others, were established in the Task Force: (1) International purchasing of medical protective equipment in close cooperation with the Austrian Red Cross, (2) purchasing of respirators and correspondingly required accessories, (3) reprocessing processes for medical protective clothing, (4) production of disinfectants, (5) production of face shields, and (6) development and production of (emergency) respirators.

The participating companies were able to contribute their expertise in all key areas. For example, the company Payer Medical and the IIM Institute developed the IIM COVID-19 protective shield to a certified product which was actually produced in series production at Payer Medical. A consortium consisting of Saubermacher, Ortner Reinraumtechnik, Christof Industries and VTU submitted an FFG application (Emergency-Call COVID-19) for the development of a disinfection system for medical protective clothing (including associated logistics processes) – the project was approved by FFG. The Styrian company Hage Sondermaschinenbau, together with medical experts from the Medical University of Graz, succeeded in developing an emergency respirator.

The positive development of the number of cases has by no means brought the activities of the COVID-19 Task Force Industry to a standstill. A continuing need for cooperation between industry and the Austrian Federal Government was also confirmed by Federal Minister Dr. Margarete Schramböck during her visit to the IIM Institute in April 2020.

Robert Schwarz
Ralph Mittermayr
Johann Christof
John Heugle
Prof. Christian Ramsauer

FACE SHIELD – DEVELOPED AND DELIVERED BY IIM

Protecting medical personnel is a top priority in the COVID-19 pandemic. Protective clothing was not available in the intensive phase of the pandemic or was not of a suitable quality.

Thanks to the initiative of the IIM Institute and its deputy Dr. Hans Peter Schnöll in cooperation with Prof. Philipp Metnitz, head of the Clinical Department for General Anesthesiology, Emergency and Intensive Care Medicine at the Med Uni Graz, the IIM-Team was able to develop and deliver a large amount of urgently needed face shields for the KAGes within a short time.

Lukas Kreilinger and Dr. Hans Peter Schnöll with the first prototype

Federal Minister Dr. Margarete Schramböck at a press conference with the faceshield designed and produced at the IIM

Manuel Lesser and Lukas Kreilinger worked in shifts producing 20 h/day

Prof. Christian Ramsauer and
Dr. Hans Peter Schnöll delivering
the first batch of faceshields to
Prof. Philipp Metnitz of KAGes

Pilot Production at IIM

Within the production of the pilot series in the Schumpeter Laboratory for Innovation, 5,000 protective shields were produced by operating more than 30 3D printers. The 3D printing capacities of the institute were supplemented by additional printers from other institutes of TU Graz, the ÖH and private persons. Up to 400 protective shields could be produced per day. The protection shields were tested by doctors during operation, checked from a hygienic point of view by the responsible KAGes authority and approved for the use in non-surgical areas.

The Protective Shields

The protective shields are reusable and can be easily cleaned and disinfected. The protective shield of the pilot series essentially consists of three components: The carrier part of the shield is made from PLA plastic using the FDM 3D printing process. In the pilot series, the visor itself consists of a commercially available overhead film, which is punched using a DIN A4 four-hole punch and fixed to the carrier part. If necessary, this enables the visor to be exchanged or cleaned easily. The protective shield is attached with a length-adjustable, washable, rubber band.

Series Production at Payer Medical

The protective shield, developed together with doctors from several hospitals and produced in a pilot series, was subsequently developed into a series product together with the Styrian company Payer Medical. It offers effective protection against a droplet infection through an optimized shape of the visor and has been optimized in particular with regard to safe reuse by simple cleaning and disinfection. The product is certified and approved as personal protective equipment according to EN 166. Payer Medical guarantees the highest quality standards through production in compliance with the medical standard ISO 13485. The protective shield "PAYERprotect" is produced in Austria with a short and stable supply chain to support the medical field and all those who need special protection when dealing with others. More information is available at www.payergroup.com.

Great potentials through the cooperation of makers, industry and research

This project showed the great potential of combining the strengths and opportunities of the maker community, industry and university research. Bottlenecks in the supply of protective equipment were quickly eliminated and the long-term availability of the product was ensured through series development.

PRODUCT DESIGN

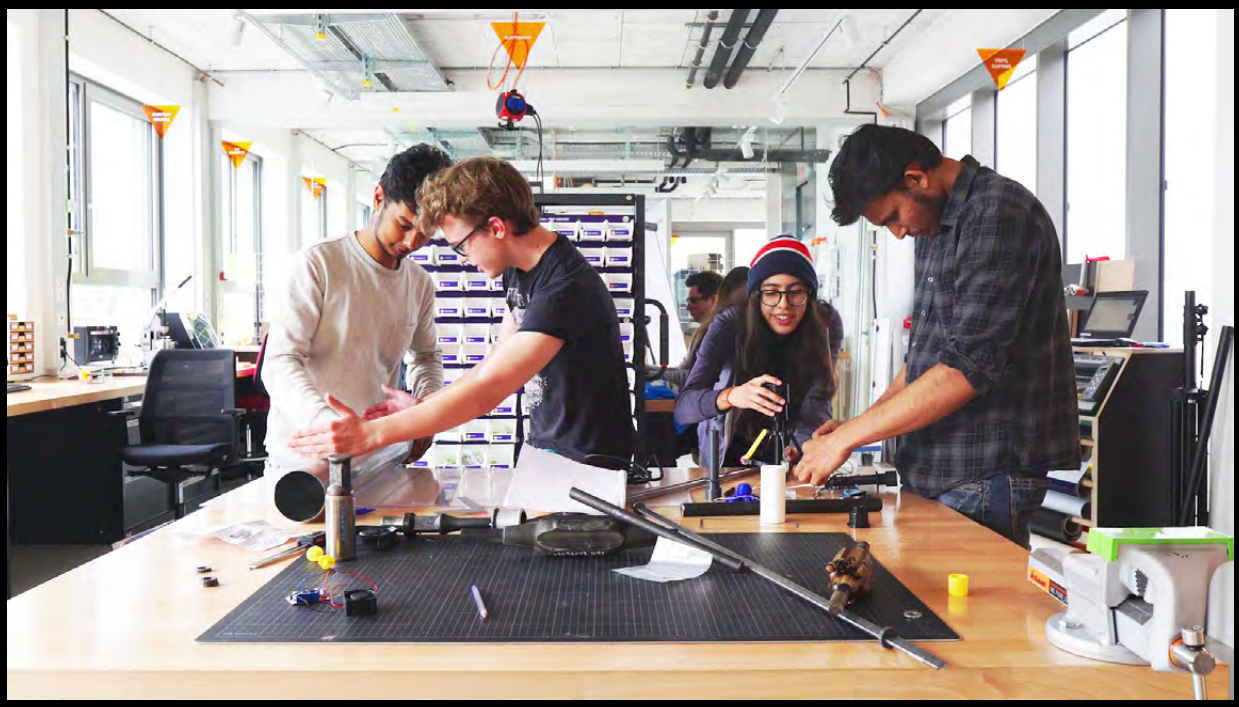
Real-life industry projects for hands-on experience

Video:
Product Innovation
at IIM

Product presentation by E-mmunity
at Innovation Festival 2019
(Project partner: Miba AG)

In order to develop and design new products, the institute established the course “Product Innovation” (PI). Inspired by the one-year program about Design Thinking at the d.school at Stanford University in California (USA), it is a unique course in Austria. Following the concept of problem-based learning, the course gives students the opportunity to work on real-life tasks given directly by industrial partners. They not only provide tasks but enable the students to realize their ideas by providing them with a project budget. In return, the student teams create numerous ideas, some of them even resulting in patents and new products.

During one full academic year, students work in teams on the given tasks from industry. The students have the chance to develop their knowledge as well as their soft skills while they gather real-life experience and ECTS-credits for their studies. The industrial partners get the opportunity to engage with highly motivated students and potential future employees.



Prototyping a smart sucker rod for oil pumps by Team Somnic (Project partner: OMV AG)

Typically, the results for each company are several new product ideas, a product concept, a business plan and a working prototype.

Winning team of 2019 – Team IoTrex (Project partner: Ventrex GmbH)

International and interdisciplinary student teams are recruited by the IIM Institute for each project. At the beginning of the course, interested students have to prove their skills and to show their abilities during a welcome day. Only the best have the opportunity to participate. The student teams are constantly trained in workshops given by internal and external experts to provide knowledge of e.g. design thinking, creativity techniques, presentation techniques and many others.

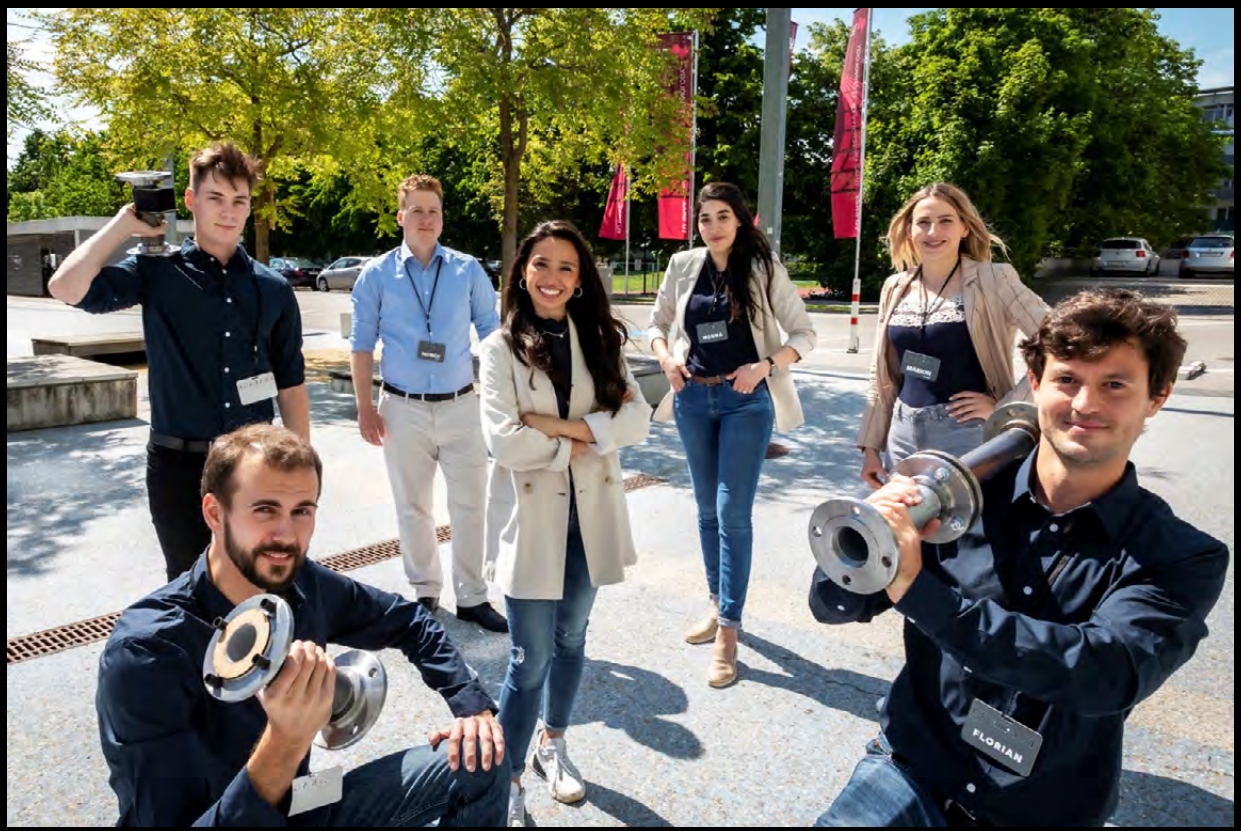
Additionally, after receiving a basic training, the students have access to the Schumpeter Laboratory for Innovation to conduct meetings, workshops, socializing events and prototyping sessions. During work hours they also have access to the FabLab facilities, thus enabling the students to generate rapid as well as detailed prototypes of their ideas and concepts. ▶

Product Innovation Teams 2018/2019
at the Innovation Festival

Totally intuitive plant monitoring
and control system by team HepTec
(Project partner: Andritz AG)

In 2006, Product Innovation started as "Product Innovation Project" with one student team. Since then the concept was adapted and developed further from the overall project managers Dr. Hans Peter Schnöll, Dr. Alexander Pointner, Dr. Thomas Böhm, Patrick Herstätter and recently Marion Unegg. In fact, it has developed tremendously positive, with an increasing number of students and projects leading to a record of nine projects conducted in the academic year 2018/2019. Several student exchange programs and collaborations, established with Pace University (New York City/USA), Aalto University (Helsinki/FIN) and University of Maribor (SLO) have led to an even more international orientation of the project. Due to the great success, additional courses for product design like the Makerthon or “Design Thinking and Rapid Prototyping” were developed.

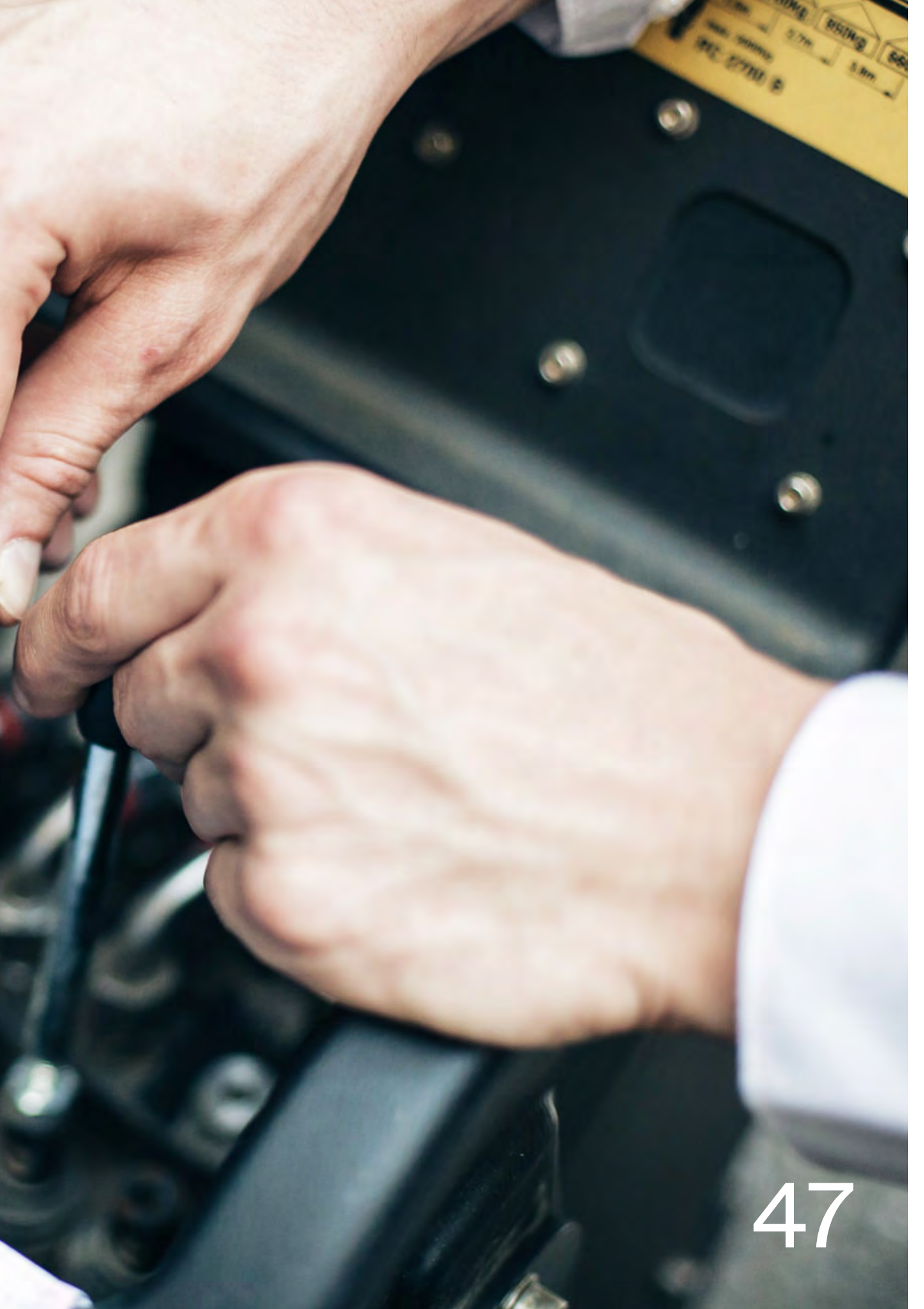
The grand final of the annual "Product Innovation" projects is the Innovation Gala, where the student teams present their results to the public, representatives from industry and academia.



Project managers Patrick Herstätter and Marion Unegg
with Team LEAK.AGE (Project partner: OMV AG)
at the Innovation Gala 2021

Product Innovatiaon 17/18:
Team OMV - Smart device for
pipeline corrosion monitoring

EXPERTISE



RESEARCH

Agility

Increasing market volatility and uncertainty force manufacturing companies to adapt their operating model to a substantially changing environment. For this reason, it is necessary to anticipate uncertainty and deal with its effects on operations proactively. The agility concept can be seen as a key to thrive in such a challenging environment.

> The principal idea is to mitigate risk in market downturns and to take advantage of opportunities in upturns to achieve superior long-term corporate performance.

Agile manufacturing enables companies to prepare proactively for uncertainties and to react quickly to changes in order to optimize the economic situation by leveraging the whole value chain. It is essential to consider the organization holistically to assure that agile operations come to life in industrial practice. Besides implementing operational agility levers, a culture open to change has to be established and organizational structures and behavioral patterns in management need to be addressed.

▶ PhD theses on this topic

Dr. Wolfgang Unzeitig
Dr. Matthias Schurig
Dr. Christian Rabitsch
Dr. Alexander Pointner
Dr. Martin Kremsmayr
Dr. Hugo Karre
Nils-Christian Böhnke
Elias Auberger
Heimo Preising
Florian Kulmer


Select Machine ...
2D
3D
Temperature
Energy
History
Material
Statistics
Menu
Time

Efficiency in Operations

In the past, outsourcing of manufacturing was a key factor in strategic decisions in high-cost regions such as Europe. Since the economic crisis, governments have realized the importance of supporting companies in order to bring back manufacturing in certain industries and, overall, to strengthen the Western economy. Digitalization (Industry 4.0) is seen as a main enabler of this, as to survive in the global competition new technologies, working methods and business models are necessary.

> The overall aim is to further increase the efficiency of production, while at the same time move towards batch size one and offer highly personalized products to customers all over the world.

Lean serves as an prerequisite for digitalization in production. In a company it is therefore important to foster not only lean methods but also the lean philosophy. In times of the gobal climate crisis energy efficiency of operations becomes an essential research focus.

▶ PhD theses on this topic

Dr. Mario Kleindienst
Dr. Markus Hammer
Dr. Stefan Heldmann
Dr. Matthias Wolf
Maria Hulla
Atacan Ketenci
Kai Rüdele

Product Design

Successful companies offer the right product at the right time at an appropriate price. As a consequence of accelerated changes in the business environment such as customer requirements or available technologies, it is becoming more and more difficult to fulfill customer needs. Product lifecycles are getting shorter and time is therefore a scarce resource. Furthermore, the complexity of product design and development processes is increasing, e.g. due to the need to integrate mechanical components, electronics and software. Characteristic examples therefore are cyber-physical systems as part of industry 4.0. To meet upcoming challenges, it is essential to avoid unnecessary external and internal complexity and to minimize unavoidable complexity.

Design Thinking can be one answer to face those challenges. It is a set of both, mindsets and design-based activities that foster the collaboration required to solve problems in human-centered ways. Thinking like a designer can transform the way organizations develop products, services, processes, and strategy.

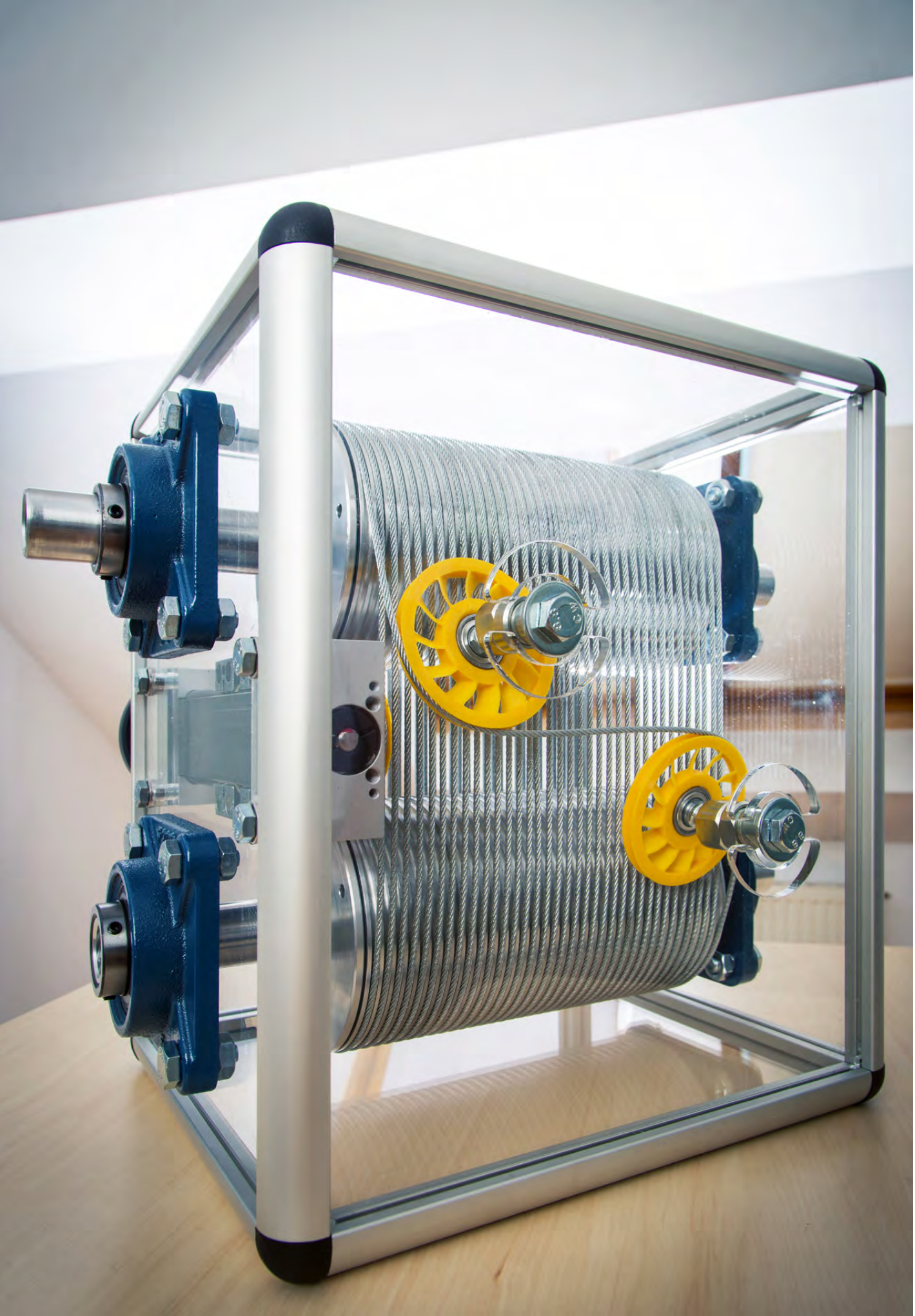
> The Design Thinking approach brings together what is desirable from a human point of view, what is technologically feasible and economically viable.

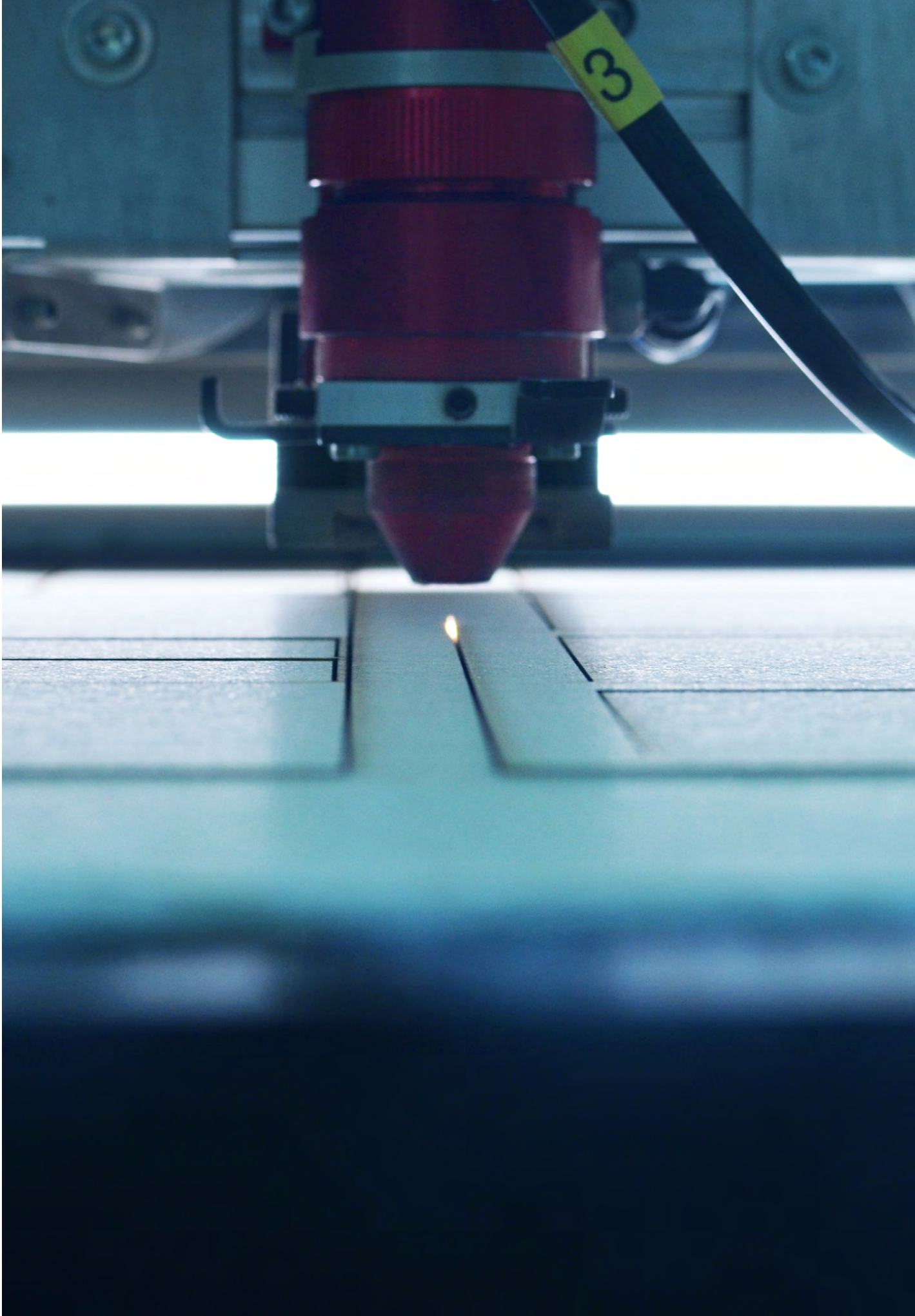
Three key factors make Design Thinking successful – following the Design Thinking process, working in multidisciplinary teams as well as offering a variable space. The Design Thinking process is based on the intuitive workflow of a designer. The teams are led through iterative loops which take the participants through six phases – understanding, observation, defining the point of view, ideation, prototyping and testing. The focus is set on a deep understandingof the customer – his gains, pains and experiences.

The new Schumpeter Laboratory for Innovation, offers the opportunity to research on Product Design to strengthen the cooperation of maker, the established industry, start-ups and scientific research.

▶ PhD theses on this topic

Dr. Hans Peter Schnöll
Patrick Herstätter
Oliver Moerth-Teo




3

Maker Movement

The maker movement is based on the idea that everyone can design, manufacture and distribute own products.

> With affordable access to digital production technologies, today it is possible for everybody to realize their own product ideas quickly and easily.

The products are either locally made in makerspaces or manufactured at decentralized and globally available manufacturing facilities. Also in industry the trend of making is becoming increasingly important. Three main drivers are responsible for the emergence of the maker movement: Firstly, the tools to innovate such as laboratory capacity, processing power, CAD programs, 3D printers for prototyping and simulation software are much more affordable today. Secondly, individuals have access to production infrastructure of industrial quality such as FabLabs or makerspaces. Finally, open databases allow the use of various designs and thus a much more efficient development process. Research at the IIM Institute focuses on the impact of the maker movement on start-ups, SMEs and established firms.

▶ PhD theses on this topic

Dr. Thomas Böhm
Dr. Matthias Friessnig
Andreas Kohlweiss
Marion Unegg

MAKER, INDUSTRY AND RESEARCH – MI&R #1

2017–2019

The established cooperation of industry and research is a key enabler for innovation in our society. In our times, the industry has to deal with high degrees of uncertainty and volatility and is therefore, e.g. forced to shorten innovation-cycles.

International studies show, that so-called makers have substantial potential to generate disruptive innovations. Makers are creative minds, with the intent to develop new products and services by using the potential of open source simulation and design software as well as digital production technologies like additive manufacturing that are offered for the public, e.g. in FabLabs and other makerspaces.

Futurologists see makers as the physical version of web 2.0, which is revolutionizing the industry through an entirely new ecosystem based on crowdfunding, crowdsourcing and e-commerce. The great innovation-potential of makers need to be integrated into the already well-established cooperation of industry and scientific research. New products and services are developed more effectively when creative students and makers, researchers, start-ups, SMEs and established companies meet at the same location and work collaboratively together.

For this reason, the Institute of Innovation and Industrial Management initiated the 3-year project “Enforcing Innovation across Maker, Industry & Research” (MI&R).

DesignLab at the Schumpeter Laboratory for Innovation

Industry partners MI&R #1 (2017–2019)

PUBLIC PARTNERS

Graz University of Technology
Austrian Federal Ministry of Education, Science and Research

INDUSTRY PARTNERS

Andritz AG
AVL List GmbH
Energie Graz GmbH & Co KG
Knapp AG
Knill Group
Logicdata Electronic & Software Entwicklungs GmbH
Magna Steyr Fahrzeugtechnik AG & Co KG
Miba AG
NXP Semiconductors Austria GmbH
OMV AG
Orasis Industries Holding GmbH
Pankl Racing Systems AG
Remus-Sebring Group
Ventrex Automotive GmbH
voestalpine High Performance Metals GmbH

SUPPORTERS

Alpen-Maykestag GmbH
Conrad Electronic SE
Hilti AG
Pichler Medientechnik e.U.
Styrian Business Promotion Agency SFG

MI&R had two main goals:

- Development of strategies, methods and cooperation-models to enforce the cooperation between the stakeholders involved
- Development and creation of an innovation-enhancing work environment to support the stakeholders involved – the Schumpeter Laboratory for Innovation

More than 60% of the 3 Mio. € project-budget was provided by third-party revenues from the IIM Institute by cooperating with 15 industry partners – Andritz, AVL, Energie Graz, Orasis, Knapp, Knill Group, Logicdata, Magna, Miba, NXP, OMV, Pankl, Sebring, Ventrex and voestalpine.

Furthermore, the project was supported by the ministry for digital and economic affairs, Graz University of Technology, the Styrian Business Promotion Agency SFG and several supporters.

The brand new Schumpeter Laboratory for Innovation (800 m^2), situated at Inffeldgasse 11/III, was ready for operation in November 2018 and was opened officially at April, 25th 2019. Within MI&R #1 93 cooperations were developed, conducted and improved. A regular exchange between all industry partners, makers and researchers is ensured by biannual coordination meetings and by presenting ongoing projects such as ideation workshops, rapid prototyping workshops, Makerthons, innovation weeks, value analysis workshops and many more.

MAKER, INDUSTRY AND RESEARCH – MI&R #2

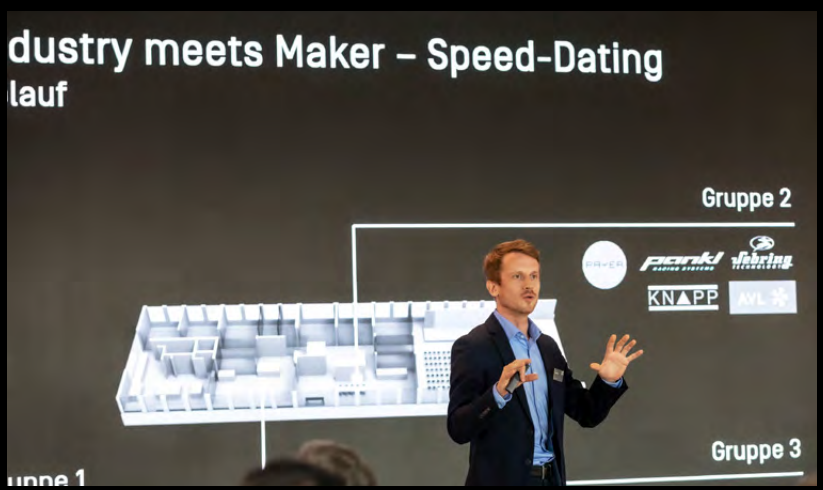
2020–2022

The successful project MI&R #1 (2017-2019) is continued with edition 2 – MI&R #2 (2020-2022).

Based on the experience gained, the focus of the new project is placed even more on topics of innovation and product development. The new Schumpeter Laboratory for Innovation plays its central role as a focal point for further cooperation between makers, industry and university research.

Cooperation models that have already been developed are being further developed and new formats are being designed. One of the key findings of the first MI&R project is the positive effect of the regular exchange of the industrial partners involved in the half-yearly coordination meetings, during which the planned and already implemented cooperations were presented by the industrial partners themselves and discussed together with the involvement of students.

Despite the very diverse group of industrial partners (representatives from different industries) in the first project MI&R #1, large thematic overlaps became apparent. Common challenges should be solved together in terms of effectiveness and efficiency. The institute offers a new platform therefore.



Project leader Dr. Hans Peter Schnöll at the kick-off meeting of MI&R #2

Industrty partners MI&R #1 (2017-2019)
and MI&R #2 (2020-2022)

The project "MI&R #2" offers an even stronger contribution to support the cooperation of Maker, Industry and Research:

- Thematic priorities are set each year in coordination with the industrial partners. (e.g. additive manufacturing, digitization, business model development). These focal points are dealt with and discussed on the one hand in the cooperation models to be carried out and in the regular network meetings.

- For specific topics, the new Schumpeter Laboratory for Innovation will be the meeting point for all industrial partners who want to tackle challenges together. The IIM Institute takes on the development and organization of these network formats.

INDUSTRY PARTNERS

Andritz AG
AVL List GmbH
Elin Motoren GmbH
Fronius International GmbH
ÖBB-Technische Services GmbH
OMV AG
Orasis Industries Holding GmbH
Palfinger AG
Payer International Technologies GmbH

SUPPORTERS

Alpen-Maykestag GmbH
Conrad Electronic SE
Hilti AG
Pichler Medientechnik
Trotec Laser GmbH

Discussion of industry partners
with students

Stefan Kreppel and Christine Spernbauer

Audience at the MI&R meeting

Panel discussion on "Rethinking digitalization – prepare for a revolution" with Vice-rector Horst Bischof, Prof. Christian Ramsauer, Dr. Markus Tomaschitz and Dr. Michael Moosburger

Michael Mühlögger and Dr. Theodor Sams discussing with students

TEACHING

The institute offers 32 courses in the field of Innovation and Industrial Management to educate Bachelor, Master and PhD students of the Schools of Mechanical Engineering and Business Economics, Software Engineering, Physics and more at Graz University of Technology.

Besides the traditional frontal classroom teaching, students are encouraged to actively interact in many courses. Our IIM Seminar Room is built to teach case studies in the same way as at the Harvard Business School. Courses also take place in the LEAD Factory, the FabLab and the DesignLab, where participant-centered learning is the key. Several company visits in Styria offer students additional insights besides teaching in the classroom.

Courses offered

BACHELOR-PROJECT

Bachelor students of Mechanical Engineering and Business Economics are working on a project in the field of innovation and industrial management, that comprises a theoretical and a practical (experimental) part. The students have to prepare a Bachelor thesis to successfully complete this project.

Project (371.000, 371.001)

INNOVATION MANAGEMENT

The main innovation course at the institute in the master program covers the core topics of innovation. Besides basic principles of innovation students are introduced to fundamentals of innovation management and methods and tools used in innovation management. As a focal topic innovation in the context of makers and founders is introduced.

Lecture (371.001)

INDUSTRIAL MANAGEMENT

The main industrial management course at the institute in the master program covers the basics of industrial management. Besides strategic topics of industrial management, the planning and design of industrial production systems is focused on including production network, factory and workplace level. Further, basic knowledge of production planning and control, energy management and current topics in efficiency management are studied. The lecture is complemented by practical exercises.

Lecture (371.002) and Practical (371.003)

LEAD FACTORY

The learning factory is an innovative and effective teaching concept that focuses on the active participation of the students during the course. By assembling the TU Graz scooter in a small-scale real-life factory and the direct comparison between the non-optimized and improved future state, students experience the direct effects of methods used in industrial engineering, logistics management and industrial energy management. At the end of the course, students have the exclusive opportunity to buy the scooter.

Laboratory practical (371.003, 371.021)

VALUE ENGINEERING

This lecture covers the basics of value analysis as a method of value management. Within the additional practical exercise, students work on a case study in small groups. Furthermore, students have the opportunity to receive the Module 1 VDI-certificate.

Lecture/Practical (371.004)

SELECTED TOPICS OF INDUSTRIAL MANAGEMENT

Participants experience hands-on in-depth topics of industrial management in practical exercises at the LEAD factory. Current topics as advanced industrial engineering and agile manufacturing methods are focused on. Through the implementation of the theoretical course contents in the learning factory, the students are able to apply the learned methods in practice.

Lecture/Practical (371.005)

PRODUCT INNOVATION

Over a whole academic year, interdisciplinary and international student teams are working on a real-life product innovation task with the support of an external company sponsor. In addition to topics related to project organization, idea generation, product design and marketing, students have the opportunity to establish industry contacts, develop soft skills and build international networks.

Project (371.007, 371.147, PHT.806UF, PHT.807UF)

DESIGN TO VALUE

A deeper insight into value analysis, especially in the field of processes and services, is provided in this course. In addition to the lecture, the main part of the practical exercise is to work on a value analysis project for a given task by applying methods as product teardown and Cleansheet.

Lecture/Practical (371.008)

SELECTED TOPICS OF INNOVATION MANAGEMENT

Participants experience hands-on in-depth topics of innovation management in practical exercises at the Schumpeter Laboratory for Innovation. Selected topics focus on following area:

(1) Idea generation
(2) Rapid prototyping
(3) Design thinking

enabling students to independently apply methods of innovation management to turn an idea into a working prototype.

Lecture/Practical (371.009)

INDUSTRIAL ENGERGY MANAGEMENT

Students get a general overview of problems in the provision of energy services resulting from technical, economic and ecological issues from a micro- and macroeconomic perspective. After successfully completion, students are able to develop design models for future-oriented problem solutions taking into account limited global resources.

Lecture (371.010) and Practical (371.011)

DOCTORAL SEMINAR TECHNO-ECONOMY

This seminar covers methodologies for the execution of scientific work as well as discussions of current problems in the field of management economics and business sociology. Furthermore, PhD students present their current scientific work.

Seminar (371.013, 371.014)

ENABLING INNOVATION

This lecture on innovation deepens the understanding on the topic by involving the participants in discussions about what innovation is and why it is challenging to be innovative. During the practical exercise, five case studies give insights on possible approaches and models to overcome innovation barriers. In addition the possibilities to protect ideas by law using patents, copyright, trademarks and related mechanisms are discussed.

Lecture (371.015, PHT.801UF) and Practical (371.016, PHT.802UF)

CREATIVITY TECHNIQUES

In addition to the lecture, in practical exercises participants discuss objectives of creativity techniques, problem solving techniques and creativity within company structures. Various systematic-analytic and intuitive-creative methods for idea generation are applied to different problem situations by the students.

Lecture/Practical (371.020)

FACTORY PLANNING AND DESIGN

Participants are tought basic theories and knowledge of the essential procedures during factory planning as well as relevant methods and procedures on how to identify and improve inefficient processes in manufacturing companies.

Lecture/Practical (371.021)

MASTER PROJECT

Master students of Software Engineering and Business Management are working independently on a specific project in the field of innovation and industrial management. For successful completion of the project the students have to prepare a project report.

Project (371.039)

INDUSTRIAL MANAGEMENT AND INNOVATION

Students learn about tasks and challenges of management within the manufacturing industry, especially in the areas of innovation and production management. Having successfully completed the lecture and practical exercise students are able to structure industrial problem situations and apply appropriate management tools in order to solve them effectively.

Lecture (371.103, PHT.805UF) and Practical (371.104)

INDUSTRIAL MANAGEMENT SEMINAR

Students gain deeper insights into the fields of production management, logistics management and innovation management. The main part of the course is the discussion of five Harvard Business Case Studies comprising real-life challenges in these topics.

Seminar (371.108, CHE.868UF)

EXCLUSIVE TUTORIAL IBL

In this seminar, relevant topics related to ongoing PhD projects are discussed.

Tutorial for postgraduate students (371.132, 371.133)

BACHELOR THESIS SOFTWARE DEVELOPMENT ECONOMY

Bachelor students of Software Development and Business Management are working on a project in the field of innovation and industrial management that comprises a theoretical and a practical (experimental) part. The students have to prepare a Bachelor thesis to successfully complete this project.

Seminar/Project (371.140)

INDUSTRIAL ENGINEERING

In course of the lecture, students are introduced to the main topics of industrial engineering, ergonomics and environmental influences on workplaces. The practical exercise covers methods to analyze and design industrial work-systems.

Lecture (371.141, CHE.866UF) and Practical (371.142, CHE.867UF)

DESIGN THINKING AND RAPID PROTOTYPING

This course concept is based on the design thinking approach taught at Stanford University. In addition to short theoretical sessions, practical, experimental and constructive work is the main focus. The project-oriented teaching concept promotes abilities and skills in product development by a free design competition. Within the course, students work in the Schumpeter Laboratory for Innovation and have the opportunity to apply their theoretical knowledge in practice.

Laboratory practical (371.176)

IMPLEMENTING INNOVATION STRATEGY THROUGH MERGER AND ACQUISITION

After detailing the reasons for using merger and acquisition to support a company's innovation strategy, students analyze a transaction from both the seller's and buyer's perspective to gain insights into the key elements of a transaction process and its timing. Additionally, special issues for technology-driven companies and the general post-transaction agenda are discussed.

Seminar (371.194, PHT.808UF)

BASICS OF INNOVATION AND INDUSTRIAL MANAGEMENT

Students get to know the fundamentals of innovation management and principles of production management. Therefore, this course provides an understanding of the challenges of a company's innovation and product creation process as well as methods for supporting the innovation process including idea generation, idea acceptance and their realization.

Lecture (371.201)

PRODUCTION STRATEGIES

This course draws the link between overall business strategies and production strategies as well as the relevant criteria for developing such strategies. Additionally, the make-or-buy decision making process, manufacturing architectures including network optimization, production capabilities through innovation in IT and production technology as well as infrastructure and human resources are covered.

Seminar (371.301)

TEAM-BUILDING

This seminar consists of theoretical inputs combined with team exercises. It mainly covers topics of organizational psychology, cooperation and competition, qualification of individuals and teams, the phenomenology of teams, success factors of teambuilding, leadership, appreciation and feedback, roles and responsibilities as well as performance control.

Seminar (371.303)

LEADERSHIP AND MOTIVATION

This course covers essential elements of leadership and introduces a systems-oriented approach to leadership and motivation. Students discuss how leadership ability is created and developed, what the characteristics of successful leaders are as well as how to lead human resources effectively.

Seminar (371.304)

QUALITY MANAGEMENT

Besides the necessity of quality management, students also learn strategies and techniques used in a modern quality management system, the procedure of the quality planning process, the quality control process, and the quality improvement process. Methods such as Failure Mode and Effects Analysis are applied in order to become familiar with their scope and application fields.

Lecture (371.305, 371.192)

WAREHOUSE LOGISTICS

The content of the course covers issues such as warehouse logistics, production logistics, business and regional specifications, warehouse objectives and areas, commissioning systems and automation data, process and material flow analysis, warehouse design, and warehouse information technology.

Lecture (371.306) and
Practical (371.307)

CHANGE MANAGEMENT

During the practical exercise, students discuss the basic principles of a system-oriented management conception, social systems and their control as well as change concepts including typology, characteristics, possibilities and limits. Students get additional insights from the practical experience of the lecturer.

Lecture (371.308) and
Practical (371.309)

SAFETY AND SUSTAINABILITY

Students learn about Environmental Management (ISO 1400x), Occupational Health and Safety Assessment (OHSAS 1800x) and Quality Management (ISO 900x). Common tools to integrate safety issues, risk control and sustainability aspects into management tasks are in a practical project work.

Lecture (371.314)

OPERATIONAL RISK MANAGEMENT

Students learn about the meaning and importance of risk and risk management within industrial organizations. This includes important steps of risk management in general, how to develop risk strategies and risk policies, different options for risk classification, tools and methods for risk identification and quantification. Further, different approaches for risk management implementation as well as inter-organizational risk management are introduced.

Lecture (371.315) and
Practical (371.316)

MANUFACTURING AND SUPPLY CHAIN NETWORK

The course is divided into four main parts: (1) assessing the opportunities for a company in going global, (2) selection process for a new manufacturing location as well as key requirements for a successful implementation of the new site and the start of production, (3) successful operation of a production site abroad and a global production network, and (4) design of the optimal supply chain for a plant within an international production network.

Lecture/Practical (371.317)

COLLABORATION WITH INDUSTRY

Having a close relationship with the industry creates value for all partners involved. Students learn early about the practical implication of what they have learned at university. Companies get insights into new developments and get to know talented students first-hand for recruiting purposes. The institute understands what is needed in industry and can adapt teaching accordingly. Therefore, different formats to work with the institute are offered. Some of them are shown in the following section.


INNOVATION
AND INDUSTRIAL
MANAGEMENT

Contract research

Projects of half a year up to three years involving Master or PhD students. It is very impressive that about 70% of all Master students participating in such a project are getting a job offer after the project has been completed successfully.

Makerthon

Within the scope of a Makerthon, interdisciplinary teams face the challenge of finding solutions for real industrial problems within 48 h, spread over three days. The aim is to identify the root of the problems, to develop ideas and concepts based on them and to realize them in the form of prototypes.

The participants are methodically supported by domain experts from the institute, coached and technically accompanied by experts from industry partners and have access to all facilities of the Schumpeter Laboratory for Innovation in order to convert their concepts into physical prototypes.

Experthon

We support companies that need timely assistance or support in dealing with current issues or in the development of product concepts or business models. A team of four University Assistants from relevant institutes at Graz University of Technology will work out results within two days to assess the feasibility and practicability.

Partner in innovation courses

Real-life tasks and budget provided by companies allow student teams to develop a product concept, working prototype and a business plan taking up to a full academic year. Our Product Innovation is an ideal opportunity to get to know students very well.

Exclusive partnership

Our partners have privileged access to our offerings focusing on innovation. This also includes the access to the Schumpeter Laboratory for Innovation. Long-term partners benefit from most of our initiatives first-hand and exclusively. We except up to 15 partners with a three-year membership. Our resources are limited, thus this partnership guarantees the best service.

Case study

In order to be more present for our students, we offer companies who are searching for talent or want to build up their brand at the university to develop a case study which can be taught in one of our courses.

Executive education

Courses in various topics of industrial management are offered for companies. Workshops for companies such as Value Engineering with Ventrex, Idea Creation with Miba, Knapp and Pankl, or Lean Management with e.g. AVL and ÖBB-Technische Services have successfully been completed.

Use of the Laboratory for Innovation

The Schumpeter Laboratory for Innovation can be booked by start-ups, SMEs as well as large enterprises as a rapid prototyping facility for idea testing and product development, or for small batch size production. Also, the IIM offers customized personal support at the Schumpeter Laboratory for Innovation directly adapted to the industry partner's needs.

Use of the LEAD Factory

The LEAD Factory provides a close-to-reality learning environment to experience lean, energy efficiency, agile operations and digitalization. The Institute of Innovation and Industrial Management provides half-day up to three-day trainings for industry partners.

Use of the IIM Seminar Room

The IIM Seminar Room, which has been designed and constructed in the unique design of a Harvard Business School case study room can be rented for workshops, teambuilding events, trainings, meetings or video conferences with larger groups. Catering and coffee breaks are included.

Guest speaker

By giving a talk (30 min. up to 2 hours) in one of our courses students get to know you and your company, which is a good way to establish relationships. CTOs or CEOs from Siemens (Dr. Busch), Magna Europe (Mr. Apfalter), Russian Machines (Mr. Eibeck) and others have already shared their experiences with our students.

Sponsorship

If you want our students to work with your products, you can contact us regarding a sponsorship model. Currently, Conrad Electronic, Hilti, Pichler Medientechnik, Alpen-Maykestag and Trotec offer their products to our students in the Schumpeter Laboratory for Innovation.

Consulting projects

The IIM Institute also offers consulting projects. Examples of finished projects are factory planning projects (brownfield or greenfield), production optimization using simulation models, the development of a new production line from scratch for series production using lean principles, value analysis projects for new or established products, energy efficiency projects, use of new technologies (industrial 3D printing), business model innovation through digitalization and more.

If you are interested in working with us, please get in touch via iim@tugraz.at or call +43 316 8737291 and let us know what you are interested in.

HARVARD CASE STUDY TEACHING

Changing the way how we teach

Harvard Business School Professor Stefan Thomke teaching the case study "Design Thinking and Innovation at Apple" at the newly opened IIM Seminar Room

Video:
IIM Seminar Room –
The Opening

Stefan Rohringer (Infineon Technologies AG)
John Heugle (Mitra Partners Inc.)

Case study teaching immerses participants in realistic business situations. Cases provide the reality of managerial decision making which includes incomplete information, conflicting goals and time constraints.

Participants place themselves in the role of top managers and decision makers. They identify the core problem, analyze it and develop potential countermeasures.

They read and reflect on the case, and then meet in learning groups to discuss their findings with other students.

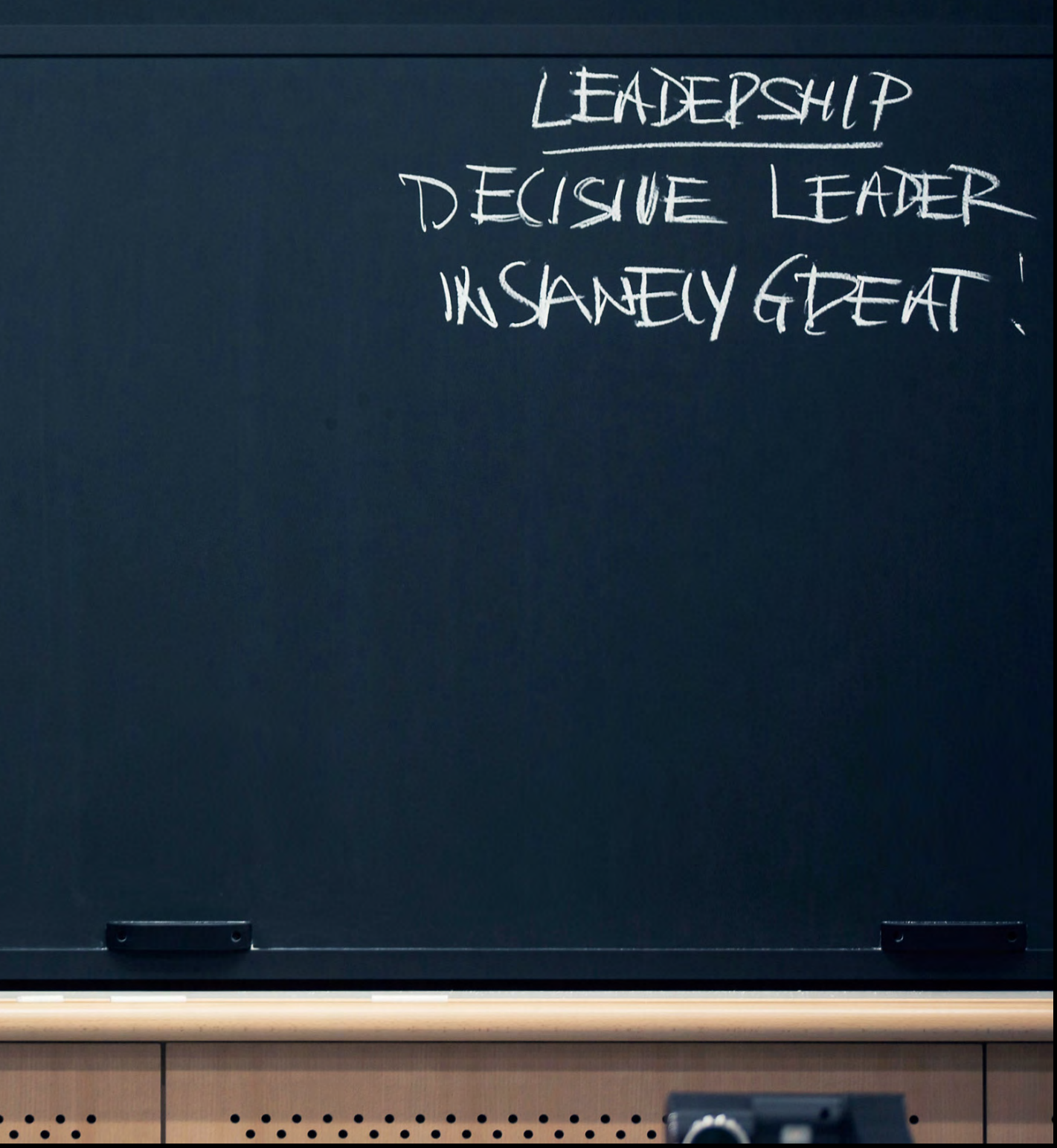
Afterward in the IIM Seminar Room, under the questioning and guidance of the lecturer, students probe underlying issues, compare different alternatives, and finally, suggest courses of action. Typically, the lecturer only steers the conversation by making occasional observations and asking questions while the students contribute to the discussion and talk (80% and more). It stimulates students' thinking and encourages discussion. The students regularly mark in the feedback forms that the case study teaching method is exciting and fun and rate this method as the best factor of the course.

Joining as guests in the running MBA program at the Harvard Business School (Boston, USA) in 2013 the Rector of the TU Graz, Prof. Harald Kainz and Vice-rector Prof. Horst Bischof were convinced of Prof. Christian Ramsauer's idea to build a case study room at his institute and to implement this teaching method.

The Harvard Business School develops more than 300 new cases per year. More than 80% of all cases sold throughout the world are written by Harvard Professors.

Every new staff member of the IIM institute who has responsibilities in teaching, participates in the case method teaching course at Harvard Business School. ▶

Prof. Stefan Thomke at the IIM Seminar Room


LEADERSHIP
DECISIVE LEADER
INSANELY GREAT

WORK & ACTIVITIES 2011–2021


RESTMÜLL

IMPORTANT DATES & EVENTS

In the past ten years, the IIM team shared numerous remarkable moments. Many of them constituted significant milestones for the institute and will long be remembered. In the following, a selection of the most memorable experiences we shared with our students, our partners from industry and colleagues from our international research network is shown.

2021

21.10. Christian Ramsauer 10 years at TU Graz

10 years ago Prof. Christian Ramsauer became the head of the Institute of Innovation and Industrial Management. This event is celebrated with the former head of the institute Prof. Josef Wohinz, professors of TU Graz, members of the institute and guests.

30.09. Go Live of new IIM Alumni network

During the last 51 years, 625 students have successfully completed their master projects or PhD projects at the institute. According to the motto “A network that connects” the IIM created an internal alumni platform exclusively for our Master and PhD students.

09.07. Defensio of the PhD thesis of Dr. Hugo Karre

Dr. Hugo Karre successfully defended his PhD thesis with the title “How to cope with uncertainty in operations”. His second assessor was Prof. Sebastian Schlund from Technical University of Vienna.

17.09. Baden-Baden Entrepreneurs‘ Talks

The IIM Institute hosted this prestigious meeting of the next generation business leaders, moderated by Reinhard Florey (CFO, OMV) and Wolfgang Litzlbauer (CEO, Umdasch). 60 participants mainly from German DAX-companies listened to presentations from Ola Källenius (Daimler), Robert Fischer (AVL), Matthias Naske (Konzerthaus Wien) and Franz Welser-Möst (Wiener Philharmoniker).

01.09. Dr. Matthias Wolf – first Assistant Professor at the IIM Institute

Dr. Matthias Wolf starts his academic career and is the first Assistant Professor in the history of the IIM Institute. In his research he will focus on advanced Industrial Engineering.

02.07. Prof. Ramsauer is elected as president

In the course of the general assembly of the International Association of Learning Factories (IALF), Prof. Ramsauer was elected as the new president of the association for the upcoming two years taking over from Prof. Joachim Metternich of TU Darmstadt. His first main event will be the general assembly during the next conference in Singapore (April 11-13, 2022)

01.07. 11th Conference on Learning Factories

The 11th Conference on Learning Factories was organized as a hybrid meeting by the IIM at the Schumpeter Laboratory for Innovation. Besides more than 140 attendees from 26 countries and 90 scientific presentations, another highlight of the two day conference was the panel discussion with industry experts about “Learning Digital Transformation” with Andre Walter (CEO, Airbus Germany); Kai Brüggemann (MD, ÖBB-TS), Gerald Hofer (CEO, Knapp AG), Laurence McHauser (McKinsey UK) and Prof. Christian Ramsauer, hosted by Prof. Horst Bischof (Vice-rector, TU Graz).

28.06. Sponsorship award Forum Technology and Scociety

Dr. Matthias Wolf, received an award for his doctoral thesis “Counteracting demographic challenges in industrial blue collar work”. The award, donated by the Forum Technology and Scociety, is granted for PhD theses with particular social relevance.

01.06. Innovation Gala

The Innovation Gala completed the project Product Innovation 2020/21. 6 Student teams presented their innovative results for their industry partners (Fronius, Palfinger, ÖBB-TS, AVL, OMV, Andritz) of the last 7 months on the stage of our Schumpeter Laboratory for Innovation. A joint live broadcasting presentation with our partners in New York was one highlight. Students were listening to Keynotes from Dr. Roland Busch (CEO, Siemens AG) and Gerald Hörhan (Investment Punk).

25.-30.05. Makerthon #5

Six student teams faced two real-life challenges from our industry partners PAYER Group and ELIN Motoren GmbH and developed innovative solutions and prototypes in only 48 hours.

30.04. Project Completion of *P2-Opti*

The research project P2-Opti was funded by the Austrian Research Promotion Agency (FFG) and started in May 2017 with AVL List GmbH as industry partner. The IIM’s main contribution includes two parts, starting with the support of decision making in the early development phase to optimize production cost and CO_2 emissions. The second part represents the recommendation of design objectives for powertrain elements to cope with uncertainties and changes throughout their entire lifecycle.

01.03. Press Conference with Federal Minister Leonore Gewessler

The press conference “TU Graz on the way to becoming Austria´s first climate-neutral university” took place at the Schumpeter Laboratory for Innovation. Amongst others, Rector Harald Kainz, Federal Minister for Climate Action Leonore Gewessler and Provincial Minister for Research Barbara Eibinger-Miedl presented the strategy to achieve a climate-neutral TU Graz in 2030.

24.02. *Spinnovation* Final Presentations

The IIM, the Research and Technology House and the Institute of Interactive Systems and Data Science have together developed the Initiative Spinnovation, which aims for students who want to turn innovative ideas into reality. Eight students from the area of Computer Science and IT worked for seven weeks on two different tasks in the focus field “Accessibility”. Finally, the students presented their interesting results.

2020

10.12. Summit Industrie 4.0 Österreich

The fifth Summit Industrie 4.0 Österreich, organized by the Plattform Industrie 4.0, took place at our Schumpeter Laboratory for Innovation. Prof. Christian Ramsauer and Maria Hulla contributed to this successful event with a presentation “Digitalization in SMEs – challenges, competences and requirements for training”.

26.11. "Techno-Ökonomie Kolloquium"

Due to the COVID-19 crisis, "Techno-Ökonomie Kolloquium" had to take place online. Andreas Kohlweiss, Atacan Ketenci and Patrick Herstätter presented concept presentations of their PhD projects.

16.11. Industrial Management thesis award

Dr. Matthias Wolf, who developed a methodology to promote healthy employment in industry by the application of physical assistance systems, received an award for his thesis “Counteracting demographic challenges in industrial blue collar work”. The award, donated by the Association for the Promotion of Business Research and Training, is aimed at outstanding industrial doctoral theses at the interface between business and technology and was handed over by Prof. Wilfried Sihn in Vienna.

03.08. Maker Days for Kids

The Maker Days for Kids 2020 took place from August 3rd to 7th. The IIM contributed to the success of the evet with stations for 3D printing, laser cutting and t-shirt labeling.

13.11. “Mind the Gap” Award to Dr. Matthias Wolf

TU Graz awards prizes for gender and diversity to employees and students. This year, Dr. Matthias Wolf received the "Mind the Gap" Award for his doctoral thesis "Counteracting demographic challenges in industrial blue collar work".

15.10. Project presentation of Product Innovation 2019/2020

38 students started the course Product Innovation in the winter semester of 2019/20 with a Welcome Week. In autumn 2020 they presented their outcomes of six innovation challenges provided by the industrial partners Andritz, AVL, Energie Graz, Pankl Racing, OMV and voestalpine Böhler Aerospace. While the teams usually present their results already in June, due to COVID-19 this year’s Innovation Gala was postponed to October, allowing our students to be physically present at the institute during the presentation of their innovative concepts and products.

02.07. "Techno-Ökonomie Kolloquium"

Due to the COVID-19 crisis, the "Techno-Ökonomie Kolloquium" hosted by Prof. Schwaiger in Vienna took place online for the first time. IIM scientific assistants Oliver Moerth-Teo (Guideline for the conceptual design of powertrain systems and their elements that enhance coping with uncertainties throughout the lifecycle) and Elias Auberger (Integration of internal production network interrelations and implications into factory planning under uncertainty) presented the concepts of their PhD theses.

30.06. Project Completion of *EnableMe50+*

The research project EnableMe50+ was funded by the Austrian Research Promotion Agency (FFG) and started in July 2017 with the Institute for Labor Research and Labor Politics at Johannes Kepler University as scientific partner as well as Rosenbauer Group and REWE Group as industry partners. Within the research project, applications of exoskeletons were investigated to prevent sick leave caused by lower back pain as this results in high cost for companies and the government. Broadly applied in the industry, the preventive employment of exoskeletons could potentially reduce cost for Austrian companies and the government by one billion Euro.

15.06. Defensio of the PhD thesis of Dr. Matthias Wolf

Dr. Matthias Wolf successfully defended his PhD thesis with the title “Counteracting demographic challenges in industrial blue-color work”. His second assessor, Prof. Ralph Bruder from Technical University of Darmstadt, participated virtually.

04.06. Guest lecture of Dr. Roland Busch

Dr. Roland Busch, deputy-CEO of Siemens AG, held a lecture for interested students as well as staff of the institute. Although a physical presence was not possible due to COVID-19, our students still took the opportunity to discuss virtually with Dr. Busch about newest developments at Siemens, their strategies to cope with the current situation and in addition get valuable feedback on their projects from a renowned industry expert.

02.06. Chancellor Sebastian Kurz meets companies of the COVID-19 Taskforce Industry

Companies presented their contributions and developments to support the national Health System to overcome the COVID-19 pandemic at Messe Graz. Chancellor Sebastian Kurz, governor Hermann Schützenhöfer, Barbara Eibinger-Miedl – member of the provincial government and Georg Knill, president of the Federation of Austrian Industries got insights by Saubermacher Dienstleistungs GmbH, VTU GmbH, Ortner GmbH, Payer International Technologies GmbH, Proionic GmbH, Hage 3D GmbH, Christof Group and Umdasch.

15.05. Federal minister visits the IIM Institute

Federal Minister Dr. Margarete Schramböck visited the IIM to meet Prof. Ramsauer, one of the Co-founder of the COVID-19 Taskforce Industry, to thank for the instant support during the pandemic. Prof. Christian Ramsauer and John Heugle (Mitra Partners) founded the COVID-19 Taskforce Industry and worked intensive with many companies and the Austrian government to get required equipment and material for our hospitals.

15.04. 10th Conference on Learning Factories

The 10th international Conference on Learning Factories, hosted by the IIM, took place from the 14th–16th of April. For many participants it was the first online conference due to the COVID-19 pandemic. 90 papers published in a special issue of Elsevier´s Procedia Manufacturing were presented to 165 participants of 28 countries. Topics of the paper presentations included interdisciplinary learning, AR and VR applications, Artificial Intelligence and energy efficiency in learning factories. The successful conference was the very first international conference in history organized by the IIM Institute.

07.04. Federal minister presents face shields developed and produced by the IIM

Federal Minister Dr. Margarete Schramböck presented the COVID-19 face shield at the official press conference of the Austrian Federal Government as a successful example for the rapid support of the public health system by the IIM Institute.

05.03. MI&R Meeting: Kick-off #2 and final meeting #1

The kick-off meeting of „Enforcing Innovation across Maker, Industry and Research" (2020-2022) took place together with industry partners Andritz, AVL, Orasis, Payer, ÖBB, Palfinger, Elin, OMV, and Fronius and representatives of the maker community. After an introduction by Dr. Hans Peter Schnöll and a presentation by Markus Haidenbauer, CEO at Orasis, about their experience of the cooperation, the keynote by Dr. Markus Tomaschitz, VP Corporate HR at AVL, "Rethinking Digitalization – Prepare for a revolution" followed. This lecture formed the basis of the discussion for the subsequent "speed dating" of students and representatives of the industrial partners.

Before, the first edition of the project „Enforcing Innovation across Maker, Industry and Research" (2017-2019) ended with the final Partner Meeting with all of our 15 Industry Partners. In course of the project, 93 cooperations were conducted to strengthen the cooperation of Maker, industry and Research. Furthermore, the Schumpeter Laboratory for Innovation was planned, built and opened in 2019.

07.04. Delivery of first charge of face shields to KAGes

The production of a pilot series of 9,000 COVID-19 face shields using 3D printing was carried out at our Schumpeter Laboratory for Innovation. The initial delivery of 1,000 units was handed over to the KAGes. In order to increase the number of units, a changeover to a more efficient production processes (plastic injection moulding) was started together with Payer Medical. With the involvement of doctors from several hospitals and experts for hospital hygiene, prototypes for these Face Shields were developed at the IIM and successfully tested in hospitals.

20.02. Visit at ModelFactory @Simtech in Singapore

Our colleague Oliver Moerth-Teo had the opportunity to visit the Model Factory@SIMTech in Singapore to exchange ideas and experiences with the local operators. Established in 2017, this learning factory allows for experimentation, learning and development of digitalization technologies for Industry 4.0 in manufacturing.

01.02. Students of the Course Product Innovation in New York City

In the course of the Product Innovation 2019/20, a group of students of TU Graz and IIM scientific assistant Matthias Eder visited Pace University in New York. Together with their American team members they worked on their project in a two-week intensive workshop. Not only has this led to numerous ideas and prototypes, but also resulted in friendships that will probably last a lifetime.

2019

2019

08.11. Visit of EU-commissioner Dr. Johannes Hahn

EU-commissioner Dr. Johannes Hahn visited the Schumpeter Laboratory for Innovation together with Rector Harald Kainz and governor Hermann Schützenhöfer to present the new “data house” of TU Graz. The visitors got a tour of our Lab from Prof. Ramsauer.

16.10. ISAM 2019 at Yale University

The International Symposium on Academic Makerspaces (ISAM) took place at Yale University, New Haven. The IIM was represented by Prof. Christian Ramsauer, Dr. Hans Peter Schnöll, Thomas Wildbolz, Andreas Kohlweiss, Patrick Herstätter and Lukas Kreilinger. In total 3 papers, 1 poster and a video were submitted, accepted and presented by the IIM during the ISAM 2019. Additionally, it delivered the perfect opportunity to connect with international researchers working in the field of academic makerspaces and learn more about global best practices.

29.11. Makerthon #4

Starting on Friday, 23 motivated students with interdisciplinary study background worked for 48 hours on 2 exciting challenges of our industry partners Komptech ("Separation of contaminants from compost") and Knapp ("Automated error handling during manipulation"). The results were presented on Sunday to a jury in the form of a 5-minute pitch. The winners were rewarded with vouchers of Conrad Electronic.

30.09. Defensio of the PhD thesis of Dr. Matthias Friessnig

Dr. Matthias Friessnig defended his PhD thesis “The Role of Maker Movement in Product Development” in the presence of the examination board including the second assessor Prof. Mirko Meboldt from the ETH Zürich.

05.08. Maker Days for Kids

The Maker Days for Kids between the age of 10 and 14 took place in the week from August 5 to 9 at TU Graz. Our IIM staff contributed to the success of this format and hosted 3D print workshops and electronic workshops.

04.07. Phablabs 4.0 Consortium Meeting

30 experts from all over Europe met at the Schumpeter Laboratory for Innovation to review the EU funded project Phablabs 4.0. In selected European FabLabs, scholars of all ages are offered exciting workshops to experience the basics of photonics and to learn working scientifically through their own research.

18.06. Visit of Green Tech Cluster

A meeting of the Green Tech Cluster with 50 participants took place at the Schumpeter Laboratory for Innovation. Prof. Christian Ramsauer talked about the influences of the increasing urbanization and digitalization on innovative maker communities as well as the importance of the right infrastructure for research and industry.

12.06.
Kick-off *Spinnovation*

With the Spinnovation (Spin Off + Innovation) project the IIM closes the gap between a 7-month Product Innovation and a 48 hours Makerthon. This very new developed 8-week program deals with patents developed at TU Graz. Students try to find application fields and improvements for this patent. The first batch kicked off on June 12th, with three students and the patent “Integration of optical sensing fibers for the purpose of production process control and quality assessment during additive manufacturing”.

24.05.
"Techno-Ökonomie Kolloquium"

The first TÖK in 2019 took place in the recently opened Schumpeter Laboratory for Innovation. The IIM contributed two concept presentation with the titles “Teach how to cope with uncertainty in operations – a learning factory based approach” (Dr. Hugo Karre) and “Development of a systematic approach for the identification of age-critical workplaces and their adaptation by technical assistance systems in industry” (Dr. Matthias Wolf).

17.05.
Makerthon #3

Within the third Makerthon, the student teams worked for 48 h on two challenges of our industry partners Pankl (“New Products and Services based on and enabled by Additive Manufacturing”) and Andritz (“Smart Solutions for Industrial Plants”). The students were guided by the industry experts of Andritz and Pankl and research staff of our institute.

06.06.
Innovation Festival #2

The second Innovation Festival took place on the blue square in front of the new Schumpeter Laboratory for Innovation. Student teams presented their results on an outdoor stage open air, afterwards the festival atmosphere with live music ended at midnight.

With nine presentations, two bands, Uptown Monotones and Evon Rose, and over 100 m² exhibition area and a great number of visitors, from both industry and university, it represented a worthy ending of our course Product Innovation 2018/2019.

25.04.
Opening Ceremony of the Schumpeter Laboratory for Innovation

Prof. Ramsauer introduced the concept of the Lab to the audience with more then 150 participants from industry and academia, including Rector Harald Kainz and Dean Franz Haas. Dr. Martin Bartenstein (G.L. Pharma), Dr. Michael Doberer (Founder Durchblicker), Prof. Karin Schaupp (Unirat TU Graz) and Prof. Stefan Thomke (Harvard Business School) discussed the topic “How does innovation work?”. Another panel with Prof. Malcolm Cooke (Case Western), Prof. Marlo Kohn (Stanford University), Prof. Björn Hartmann (UC Berkeley) and Dean Vincent Wilczynski (Yale University) discussed the very new topic of makerspaces “The value of academic makerspaces”.

08.04. Falling Walls Lab Austria

Young talents from various disciplines had three minutes to convince the top-class jury of their project in a speed performance.

The winner got the opportunity to present at the Forum Alpbach and could take part at the finals of “Falling Walls” in Berlin.

02.04. Guest lecture of Dr. Busch

Dr. Roland Busch, President and CEO of Siemens AG, gave an extraordinary presentation on how Siemens aims to turn innovations into strategic advantages and discussed open innovation in the digital age. Moreover, he pointed out the importance of collaboration of universities and start-ups to help foresee potentially disruptive technologies.

24.03. Conference on Learning Factories in Braunschweig

Prof. Ramsauer visited the 9th Conference on Learning Factories at TU Braunschweig together with five scientific assistants – Dr. Matthias Wolf, Dr. Hugo Karre, Maria Hulla, Elias Auberger and Matthias Eder. All assistants presented papers on the latest developments in the LEAD Factory. For instance, the demographic change and the use of exoskeletons in learning factories and a concept of the intoduction of a new product in the learning factory of the IIM was discussed. Prof. Ramsauer attended the IALF (International Association of Learning Factories) meeting and presented the concept of the 10th Conference on Learning Factories hosted in Graz.

07.03. Presentation of Dr. Peter Mitterbauer

The Schumpeter Laboratory for Innovation hosted the “Look-in” event of our WING students. The CEO of Miba, Dr. Peter Mitterbauer gave insights of his company and how the 1 Billion EUR company will deal with the upcoming trend of electrification. Many students followed the presentation and started a lively discussion with Dr. Mitterbauer.

2018

04.12. Defensio of the PhD thesis of Dr. Martin Kremsmayr

Dr. Martin Kremsmayr presented the results of his PhD thesis "From Lab To Scale – Managing production ramp-up in advanced materials industries" to the official examination board including the second assessor of his thesis Prof. Robert Schmitt from RWTH Aachen University.

29.11. Photonics Workshop

The Phablabs 4.0 project develops workshops concerning the topic of Photonics. Eleven partner organizations all over Europe created 33 workshops for young people from 10 to 18+ years. Participants gained hands-on experience with potential applications of light in our daily life from the working group Innovation.

26.11. Industrial Management thesis award

IIM alumni Dr. Stefan Heldmann, who developed and successfully implemented a big data-based methodology for sales forecasting in industrial companies, received an award for his thesis "Big Data Analytics for the Volatile World". The award, donated by the Association for the Promotion of Business Research and Training, is aimed at outstanding industrial doctoral theses at the interface between business and technology and was handed over by Prof. Wilfried Sihn in Vienna.

28.11. Start of occupation of the Schumpeter Laboratory for Innovation

In July 2017, the ground-breaking ceremony for the construction of the new Schumpeter Laboratory for Innovation took place. An additional floor was added to the building at Inffeldgasse 11. This newly built floor offers more than 800 m² of open space. Graz University of Technology handed over the premises to the Institute of Innovation and Industrial Management in September 2018. The interior work was completed by November 2018. Since then, the laboratory is the new workspace of the institute's working group Innovation, students and partner companies from industry. The new facility includes the DesignLab with a multifunctional stage including a 30 m² LED wall, various meeting rooms, spaces for open communication, offices for the working group Innovation and the FabLab, which is equipped with high-tech digital manufacturing equipment. The official opening ceremony took place in April 2019.

23.11. Makerthon #2

During the second Makerthon, the student teams worked for 48 h on two challenges, which were provided by AVL and Logicdata. Guided by the working group Innovation, Makerthon #2 took place at the new Schumpeter Laboratory for Innovation.

09.11. FFG at the Schumpeter Laboratory for Innovation

IIM Project Assistants Dr. Matthias Wolf and Dr. Martin Kremsmayr presented the current status and the outcome of their FFG funded research projects EnableMe50+ and FlexHep to Dr. Birgit Tauber (head of the FFG General Program) and her team. Afterward a workshop was conducted, including the "Marshmallow Challenge" and a "Rapid Experthon".

08.11. 3rd Maker, Industry and Research Partner Meeting

Within the third MI&R partner meeting specific results of the cooperations established were presented and discussed. Jordi Closa Guerrero, Director of the Makerlab network at adidas Group, gave a keynote speech on “The value of open creative spaces”. The meeting was closed with a tour through the Schumpeter Laboratory for Innovation.

29.10. Visit at Technical University of Darmstadt

Prof. Christian Ramsauer, Dr. Matthias Wolf and Maria Hulla visited the Institute of Production Management, Technology and Machine Tools, where they presented organizational topics regarding the Conference on Learning Factories 2020 to the president of the International Association of Learning Factories, Prof. Joachim Metternich. At the Institute of Ergonomics & Human factors, the preliminary results of the research project EnableMe50+ were discussed.

07.06. Innovation Festival

Seven international student teams of the Product Innovation (PI) 2018/2019 presented their product concepts, prototypes and business concepts to the public. The PI starts every year in October and ends at the beginning of June the following year with presentations of the final results. This year, the topics ranged from charging stations for electric cars in the city center of Graz with an innovative online booking system (Energie Graz) to energy recovery of damping systems (AVL) and software development for image recognition (voestalpine). The final presentations were held as part of the first Innovation Festival. A large open-air stage, live music by the Styrian band “Uptown Monotones” and team booths provided the perfect atmosphere for the event. The Audience Award 2018 for the most convincing performance was granted to the team “Charging Graz” (Project partner: Energie Graz) for their innovative business concept. Industry representatives also attended the Innovation Festival 2018. Dr. Johann Hintner (D. Swarovski KG) expressed his enthusiasm about the project and the Innovation Festival in the following statement: “I was very impressed by the high quality of the presentations at the Innovation Festival. The students were very relaxed and presented in a very humorous way; I could have listened for a long time. And I was delighted when my favorite team finally won the Audience Award.”

18.08. Case Study Teaching Seminar at the HBS

The stay at Harvard Business School in Boston enabled the scientific assistants Maria Hulla and Andreas Kohlweiss to gain first-hand experience concerning the Harvard case study teaching method, which the IIM applies in its courses.

05.08. Makerdays for Kids at FabLab

More than 100 young girls and boys took part in this event with the title “Creative work with digital tools”. Technology was taught in a playful way and young people became enthusiastic about engineering. The work of our 3D printers was followed by bright children's eyes and T-shirts personalized with foil cut by our vinyl cutters.

31.07. Official notification to host CLF 2020

The IIM applied at the Conference on Learning Factories (CLF) 2018 in Patras for being the host of the CLF 2020 and got the confirmation from the president of the International Association of Learning Factories.

18.06. Defensio of the PhD thesis of Dr. Alexander Pointner

Dr. Alexander Pointner defended his PhD thesis “Synchronizing Production Capacity with Market Demand Upswings in a Lean Production System” to the examination board including Prof. Jochen Deuse from Technical University Dortmund.

07. 06. Industrial Science Forum

On June 7, 2018, the institute organized an Industrial Science Forum on the occasion of Prof. Josef Wohinz's (former head of the institute) and Prof. Christian Ramsauer's (current head of the institute) birthdays. In addition to a keynote speech on "Frugal Innovation – Do we need a paradigm shift in innovation management" by Prof. Cornelius Herstatt from the Hamburg University of Technology, Kathryn List (Chairman of the Board, AVL Cultural Foundation) interviewed the two professors on their activities and projects at the IIM Institute then and now. At the end of this ceremony, a rich buffet was served to the approximately 100 guests, including IIM alumni as well as current employees and other representatives of Graz University of Technology. In addition to the Industrial Science Forum, the Innovation Festival of the IIM Institute took place on the same day.

07.06. Defensio of the PhD thesis of Dr. Thomas Böhm

Dr. Thomas Böhm defended his PhD thesis "Corporate Makerspaces – Operation Models, Implementation and Contributions to Organizational Learning" in the presence of the examination board including the second assessor Prof. Cornelius Herstatt from Hamburg University of Technology.

04.05. Defensio of the PhD thesis of Dr. Stefan Heldmann

Dr. Stefan Heldmann presented his PhD thesis "Big data analytics for the volatile world – New methodology and proof of concept for sales forecasting in an industrial case study" in the presence of the examination board including Prof. Hubert Biedermann from University of Leoben.

11.04. LEAD Factory becomes an IALF member

Within the International Association of Learning Factories (IALF) meeting at the Conference on Learning Factories in Patras, the president of the association, Prof. Joachim Metternich, welcomed Prof. Ramsauer and the LEAD Factory as a new member.

05.03. Visit from Oxford and Harvard Professors

Prof. Viktor Mayer-Schönberger (Professor of Internet Governance and Regulation, Oxford University) and Prof. Stefan Thomke (William Barclay Harding Professor of Business Administration, Harvard Business School) visited our Schumpeter Laboratory for Innovation.

09.03. Makerthon #1

Student teams worked 48 h on two challenges provided by the leading industrial companies Magna and Miba, led by the working group Innovation and using the equipment of the FabLab. The winner teams were awarded with tickets for the "Fifteen Seconds Festival".

26.02. 2nd Maker, Industry and Research Partner Meeting

In the course of the meeting with our MI&R partners, the output of the cooperation was presented by industry representatives. Moreover, a speed dating with students and MI&R partners was organized and the construction side of the Schumpeter Laboratory for Innovation was visited.

12.02. AVL Innovation Week at FabLab

A group of eight AVL employees from several departments and with different educational backgrounds conducted an agile product development project at the FabLab Graz for one week. The goal was to find innovative and creative solutions for current product development challenges by using our high-tech prototyping equipment.

2017

2017

07.12. Defensio of the PhD thesis of Dr. Markus Hammer

IIM lecturer Dr. Markus Hammer presented his PhD thesis “A time-based and analytics-supported management approach for resource-productive operations – Design of a structured implementation methodology based on Six Sigma to maximize profits” in the presence of the examination board including the second assessor Prof. Christian Terwiesch from the Wharton School of the University of Pennsylvania.

06.12. Topping-out ceremony

The topping-out ceremony of the Schumpeter Laboratory for Innovation took place at Inffeldgasse 11.

27.11. “22. Techno-Ökonomie Kolloquium” at the IIM Institute

The institute was the organizer of the event. Prof. Christian Ramsauer introduced all services provided by the IIM.

29.05. Presentation of student projects in the Aula

Every year, student teams of the course “Product Innovation” work on new product concepts and prototypes in cooperation with industrial partners for a full academic year. From 2015 till 2017, the final presentations took place in the Aula of Graz University of Technology. Guests from industry, politics and the scientific community see motivated students from all over the world presenting their developed prototypes and business concepts after a keynote speech. Industry partners provide the tasks and financial support for the student projects. In return, the sponsors receive creative and innovative ideas for their businesses. Examples of partner companies are Porsche Austria, OMV, AVL, voestalpine, Infineon and Google, amongst others. In 2017, Johannes Gradwohl (CEO Logicdata), Dr. Markus Tomaschitz (VP HR AVL), Dr. Wolfgang Zitz (VP Contract Manufacturing Magna Steyr), and Stephan Zöchling (CEO Remus-Sebring Group) discussed the “Battle for Talent” during a panel discussion.

24.10. Defensio of the PhD thesis of Dr. Mario Kleindienst

Dr. Mario Kleindienst presented his PhD thesis “Digitization in manufacturing industry – A systemic approach to align digitization with corporate strategy in small and medium-sized enterprises” to the examination board including the second assessor Prof. Hubert Biedermann from University of Leoben.

05.10. First Digitalization Day at voestalpine

Prof. Christian Ramsauer gave a presentation at the first voestalpine Digitalization Day with the topic “Early detect, fast react – Agility as a crucial success factor in a volatile world”.

05.05. Kick-off meeting for the FFG research project *P2-Opti*

The start of the Project Product- and production optimization covering the entire automotive powertrain lifecycle took place in the IIM Seminar Room. Altogether 10 participants from the IIM Institute and AVL GmbH discussed the contents of the seven work packages of the new joint project supported by the FFG.

16.03. EUMICON Enquete 2017

“Smart Mining & Production” was the topic at EUMICON Enquete at the Ministry for Digital and Economic Affairs in Vienna. Prof. Christian Ramsauer spoke about digital transformation in industry.

03.02. Cross-Industry Conference on Agile Operations

On February 3, 2017, more than 100 invited guests from industry joined the cross-industry conference on agile operations in the Aula of Graz University of Technology. Prof. Christian Ramsauer, Dr. Detlef Kayser (Member of the Board, Deutsche Lufthansa AG) and Dr. Christoph Schmitz (Senior Director, McKinsey & Company) hosted the conference and presented the new book "Erfolgsfaktor Agilität – Chancen für Unternehmen in einem volatilen Marktumfeld." Amongst others, the audience listened to speeches from Dr. Christoph Lütke Schelhowe (Vice-president, Zalando), Karl-Friedrich Stracke (President, Magna Steyr) and Dr. Sascha Hemmen (Senior Consultant, Mercedes-Benz Management Consulting). Specific topics on agility were further discussed in different breakout sessions.

01.01. IBL and PSM merge to IIM

The Institute of Industrial Management and Innovation Research and the Institute of Production Science and Management merged to become the Institute of Innovation and Industrial Management. The institute got a new corporate identity.

2016

13.12 Defensio of the PhD thesis of Dr. Christian Rabitsch

Dr. Christian Rabitsch defended his PhD thesis "Methodology for Implementing Agility in Manufacturing Companies" in the presence of the examination board including the second assessor Prof. Hubert Biedermann from University of Leoben.

24.06. Best Paper award for Dr. Martin Kremsmayr

At the 3rd International Conference on Ramp-up Management (ICRM) at RWTH Aachen University, Dr. Martin Kremsmayr was awarded the Best Paper award among 25 international researchers.

31.05. Product Innovation Project – Final Gala

International student teams presented their innovation projects to representatives of academia and industry. The company partners included Logicdata, Infineon, Beneq and Porsche Austria. Prof. Cornelius Herstatt from Hamburg University of Technology gave an engaging keynote speech with the title "Imperative Frugal Innovation – Not only for the Third World".

08.04. Defensio of the PhD thesis of Dr. Matthias Schurig

Dr. Matthias Schurig presented the results of his PhD thesis "Methodology to evaluate the agility of a production network using a stress test approach" to the official examination board including the second assessor of his thesis Prof. Joachim Metternich from Technical University of Darmstadt.

15.01. Project presentations of "Design Thinking and Rapid Prototyping"

After one week of developing a product concept, the students of the institute's "Design Thinking and Rapid Prototyping" course presented their results: working prototypes of remote-controlled cars.

2015

15.12. Defensio of the PhD thesis of Dr. Hans Peter Schnöll

Dr. Hans Peter Schnöll defended his PhD thesis “Integrated Product Development – A process model for the context-specific design of the product development process of components made of fiber-reinforced plastics” in the presence of the examination board including the second assessor Prof. Hubert Biedermann from University of Leoben.

22.04. FabLab Graz going public

At the beginning of 2014, Prof. Christian Ramsauer applied at the Fab Foundation in Boston to be part of the FabLab (Fabrication Laboratory) network. On April 22, 2015, during the 10-year celebrations of the Frank Stronach Institut (FSI), FabLab Graz hosted its first public event showing the newly built infrastructure to guests from various industries. The idea was that creative people who enjoy making things (makers) meet at a workspace where they have access to high-tech digital manufacturing equipment. Exchanging ideas and experiences as well as knowledge of how to make things are essential for creating new product ideas. One of the first product ideas, designed and produced at FabLab Graz, was an iPhone cover milled from wood and personalized with a laser cutter.

20.10. 2nd Industry Dialog on Research

At the Industry Dialog on Research by the Forum Technik und Gesellschaft at TU Graz, Prof. Christian Ramsauer gave a presentation on “New Ways of Mobility and the Challenges of Future Manufacturing”.

15.06. University Conference at the IIM Seminar Room

On the invitation of Rector Prof. Harald Kainz, the rectors from all 21 Austrian public universities met in the IIM Seminar Room. Prof. Christian Ramsauer had the opportunity to present Austria’s only Harvard case study room.

02.06. Product Innovation Project – Final Gala

The final gala took place at the Aula of Graz University of Technology. Project topics were provided by several companies including Google, voestalpine and Fronius as well as by the University of Oxford. Oxford Prof. Viktor Mayer-Schönberger gave an engaging keynote speech.

28.01. Information Day – Recruiting Internship at FSI

An information event that connected students with industrial companies was organized.

17.04. Opening of the IIM Seminar Room with Harvard Prof. Stefan Thomke

Although it was very crowded, all people were silent when Harvard Professor Stefan Thomke began presenting the case study “Design Thinking and Innovation at Apple” on April 17, 2015, in the brand new IIM Seminar Room. Our special guest Prof. Thomke developed this thriving case study for the MBA program at the Harvard Business School (Boston, USA). Participants from industry, science and politics discussed the case study at the new IIM Seminar Room, which was designed and built exactly like the case study rooms at the Harvard Business School. With this unique facility and the application of the case study teaching method, we are able to provide high-quality academic management training and executive education.

2014

11.12. Defensio of the PhD thesis of Dr. Wolfgang Unzeitig

Dr. Wolfgang Unzeitig presented his PhD thesis "Method to consider uncertainties during the early phase of planning a factory" to the examination board including the second assessor Prof. Marc Reimann from University of Graz.

26.11. Open House Day – Sparking Scooter

An Open House Day was performed at the institute including a presentation of the Sparkling Scooter project.

23.10. "Kaminabend des Industrieforum F&E"

A fireside talk with Prof. Christian Ramsauer was part of an industrial forum powered by the Federation of Austrian Industries.

14.10. "WKO Unternehmertag 2014"

The panel discussion at the Entrepreneur Day of the Austrian Economic Chambers at the Graz exhibition center was performed with Prof. Richard Precht and Prof. Christian Ramsauer.

20.08. European Forum Alpbach 2014

The institute contributed to the annual interdisciplinary scientific forum at Alpbach.

23.09. Teambuilding in preparation for the Product Innovation Project 2014/15

Students of the Product Innovation took part in a teambuilding event. The highlight was the visit of Prof. Viktor Mayer-Schönberger at Zell am See.

02.06. PSM Student Day

The annual information event for students was organized at the Institute of Production Science and Management.

22.08. Agility at the European Forum Alpbach

The podium discussion on "Agile and Robust Supply Chain – How to successfully manage volatility in economy" at the European Forum Alpbach on August 22, 2014 was organized by Prof. Christian Ramsauer. Invited guests included Guan Zhe Chen (Senior Director, World Bank), Dieter Messner (Managing Director, OBI International), Dr. Georg Kasperkovitz (COO, Rail Cargo Austria AG), Prof. Reinhilde Veugelers (University of Leuven), Raimund Diederichs (Senior Director, McKinsey & Company) and Dr. Kurt Gruber (head of SCM, Infineon Technologies). Since the financial crisis in 2008, volatility and uncertainty appear to be "the new normal" for companies across different industries. The concept of agility is an answer to create a significant competitive advantage in today's highly dynamic business environment and there is a broad consensus that this topic will soon be on the agenda of every CEO.

02.06. Product Innovation Project – Final Gala

The project teams of the Product Innovation presented their results at the Aula of Graz University of Technology. The project topics were provided by Magna, Philips and Secop. The highlight of the gala was the keynote speech by Prof. Frank T. Piller of RWTH Aachen University.

23.05. WING Jubilee Congress

On the occasion of the 50th anniversary of the Association of Industrial Engineers, the WING Jubilee Congress was organized.

22.05.
Official opening of the FabLab Graz

The FabLab Graz opened in the course of the celebration of the 10th anniversary of the Frank Stronach Institute.

14.05.
Product Design Gala Helsinki 2014

The Product Innovation Project teams presented their results at the Aalto University in Espoo/Helsinki.

04.04.
The LEAD Factory starts its operations

In the course of the annual "Long Night of Research", the IIM Institute organized the open house event "IBL LeanLab" at the newly built Learning Factory – today´s LEAD Factory. More than 200 visitors had the opportunity to see a state-of-the-art assembly line producing scooters in a realistic factory environment using industry standard equipment. In the Learning Factory university course, students have the opportunity to study essential production principles focusing on the topics of Lean management, Energy Efficiency, Agile operations and Digitalization (LEAD) by actually assembling a real product.

2013

12.12.
Awarding of the Erzherzog-Johann-Medal to Prof. Josef Wohinz

In the course of the 125th anniversary of Graz University of Technology, Prof. Wohinz was honored for promoting the image of and development of the university through his profound work.

17.10.
Visit at MIT and HBS

Rector Prof. Harald Kainz, Vicerector Prof. Horst Bischof and Prof. Christian Ramsauer visited colleagues at the Massachusetts Institute of Technology (MIT) and participated as guests during the MBA program at the Harvard Business School (HBS). A TU Graz Scooter was handed over to Harvard Professor Stefan Thomke.

01.10.
Opening of the DesignLab

The DesignLab with about 140 m^2 was opened at Münzgrabenstrasse. It is a space available 24/7 for students participating in the innovation courses offered by the institute.

06.06.
Industrial Science Forum

Presentation of contributions to techno-economical questions and problems on the occasion of the 70th birthday of Prof. Josef Wohinz.

13.05.
Product Innovation Project – Final Gala

The student teams, working on their innovation projects for two semesters presented their results to members of the university, industry and students. The topics of the projects were provided by Philips and Anton Paar.

25.04.
Product Design Gala Helsinki 2013

The Product Innovation teams presented their results at the Aalto University in Espoo/Helsinki.

11.04.
"Techno-Ökonomie Kolloquium"

The conference for the business-oriented institutes of all three Universities of Technology in Austria (Leoben, Vienna and Graz) was hosted by the institute.

03.04.
The first 3D printer (3D Touch) – The starting point of the FabLab Graz

The 3D-Touch (3D Systems) model was purchased. Since then, it has been used intensively by our students of the Product Innovation teams.

2012

06.12. Defensio of the PhD thesis of Dr. Georg Premm

Dr. Georg Premm defended his PhD thesis “Energy-oriented Production Strategy” in the presence of the second assessor Prof. Harald Raupenstrauch from University of Leoben.

01.10. New location at Kopernikusgasse

The institute moved to new facilities on the second floor of Kopernikusgasse 24.

30.10. Defensio of the PhD theses of Dr. Verena Manninger and Dr. Elisabeth Plankenauer

Dr. Verena Manninger defended her PhD thesis “Knowledge-Based Innovation Management – A Process-oriented Approach for Integrating External Knowledge in the Front-End of Innovation” to the examination board including the second assessor Prof. Armin Kreuzthaler. On the same day also Dr. Elisabeth Plankenauer presented her thesis “Management of Barriers to Innovation in E-Mobility – A general framework for relevant stakeholders” and earned her PhD degree.

14.05. Product Innovation Project – Final Gala

The student team “Smart Mix” presented their outcome of the Product Innovation to representatives of academia and industry. The industry partner of their project was Philips.

27.01. DAP 2012

The presentations of the best master theses of 2012 of several institutes took place at the Frank Stronach Institute.

2011

13.10. “PSM Welcome Day”

The annual information event for students took place at the Institute of Production Science and Management.

01.07. Farewell lecture Prof. Josef Wohinz

Prof. Wohinz announced his emeritus status and held his farewell lecture.

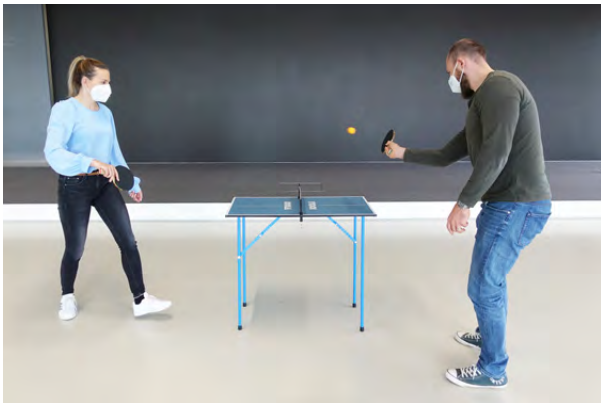
18.11. Inaugural lecture of Prof. Christian Ramsauer

Prof. Christian Ramsauer became head of the institute and held his first lecture on the topic of “Production Strategies – Present Challenges for the Industry”.

Annual teambuilding events

JANUARY

Ball der Technik



FEBRUARY 2021

Table tennis tournament

During the COVID-19 pandemic no annual teambuilding events, but table tennis with masks was possible.

MARCH

Skiing Days

JULY

Summer Workshop

SEPTEMBER

Activity organized by Prof. Wohinz

DECEMBER

Christmas Celebration

OPENING CEREMONY SCHUMPETER LABORATORY FOR INNOVATION

Prof. Christian Ramsauer with illustration of the build up of the Schumpeter Laboratory for Innovation

The Institute of Innovation and Industrial Management opened the new “Schumpeter Laboratory for Innovation” in the Inffeldgasse 11 on 25th of April 2019. Since this day, the IIM offers state-of-the-art infrastructure and the latest technologies on more than 800 m² in order to support stronger cooperation between the maker community, established industrial companies, young start-ups and university research.

Rector Harald Kainz welcoming the guests

Rector Harald Kainz and Dean Franz Heitmeir welcomed the guests. Andreas Jäger led through the event for this evening. In his opening speech, Prof. Christian Ramsauer outlined the central mission of the newly created infrastructure – the combination of creative potentials and professional competences from different fields.

One of the main goals of his initiative is to create new products and thus to create new companies (start-ups).

Representatives of three start-ups of different maturity levels subsequently enthused the guests. Dr. Stefan Hauswiesner and Arjun Thomke showed a live demo of the virtual dress fitting of the successful TU Graz spin-off Reactive Reality GmbH.

The question "How does innovation work?" was the central topic of the following panel discussion with Dr. Martin Bartenstein (G.L. Pharma GmbH), Prof. Karin Schaupp (TU Graz), Prof. Stefan Thomke (Harvard Business School) and Dr. Michael Doberer (durchblicker.at). New possibilities due to the advancing digitalization as well as appropriate qualification of employees were highlighted.

The benefits of academic makerspaces for society, industry and research were discussed with representatives of leading US universities via a live broadcast to the USA. Marlo Kohn (Stanford University), Dean Vincent Wilczynski (Yale University), Prof. Björn Hartmann (University of California, Berkeley) and Prof. Malcolm Cooke (Case Western Reserve University) discussed how the dismantling of inhibitions for the realization of new, innovative products works better through makerspaces.

Spain's entrepreneur of the year 2018, the Styrian Meinrad Spenger, who founded his start-up MASMOVIL in Madrid in 2006, also gave insights into the company's development and mentioned the importance of the new makerspace for young entrepreneurs. His company serves eight million customers and has a market capitalization of two billion euros.

Around the 150 invited guests including representatives of the Austrian universities and society as well as many owners, managing directors and board members of well-known industrial companies such as Günter Knapp (Knapp AG), Heinz Moitzi (AT&S AG), Prof. Helmut List (AVL List GmbH), Hans Höllwart (SFL Technologies GmbH), Dr. Manfred Gutternigg (Hilti GmbH), Andreas Schuster (Orasis Industries Holding GmbH) and Dr. Heinz Leitner (Komptech GmbH) were following this unique event. ▶

Video:
Schumpeter
Laboratory
for Innovation,
The Opening

Dr. Martin Bartenstein and
Dr. Michael Doberer at
the panel discussion

Opening speech of
Prof. Christian Ramsauer

Prof. Vincent Wilczynski, Marlo Kohn,
Prof. Malcolm Cooke and Prof. Björn
Hartmann at the panel discussion with
the moderator Andreas Jäger

The IIM team celebrates the opening with the audience

Kathryn List, Prof. Karin Schaupp and Prof. Hans Sünkel

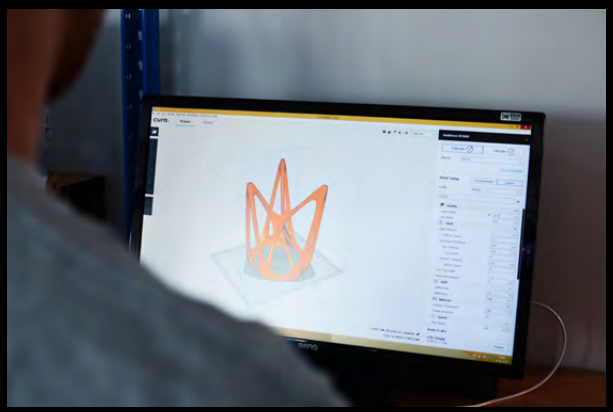
Prof. Helmut List and Vice-rector Claudia von der Linden

Siegfried Papst, Gerald Keltz and Prof. Franz Heitmeir

Prof. Hans Sünkel and Armin Egger

IIM Report (2011-2018) "LIVING INNOVATION"

SCHUMPETER LABORATORY FOR INNOVATION



The main focus of the Schumpeter Laboratory for Innovation, one of the most advanced academic makerspaces in Europe, is to support and research the collaboration of Maker, Industry and Research (MI&R). One floor of more than 800 m² is open to creative thinkers, makers, inventors, entrepreneurs and representatives from industry.

The Schumpeter Laboratory for Innovation is a place for learning, prototyping and idea exchange to foster product innovation.

FabLab II

FabLab I

The mandate is to assist all our users. Students in our courses, start-ups and industrial partners receive support along the product creation process from idea generation to market launch. The creation of an active and lively communication platform of makers from different backgrounds for mutual exchange and inspiration around the new Schumpeter Laboratory for Innovation is essential. By providing all the ingredients necessary for the product creation process, the Schumpeter Laboratory for Innovation will continue to develop and increase its innovative output. Digital production machines, multimedia equipment in a multifunctional room, meeting rooms with video conference equipment, offices and a lobby as a central point of communication are offered. ▸

DesignLab

Video:
Schumpeter Laboratory
for Innovation

Lobby

Design Lab

FabLab II

Schumpeter meeting room

FUNDED RESEARCH PROJECTS

Phorsch! Photonik für Schulen

The project aims to make photonics as a key technology of the 21st century tangible for pupils through research-based learning. To do this, educational formats that have already been developed and tested are carried out with students and teachers. In particular, the "Photonics Explorer" kit is used for this, and the very successful photonics workshops developed in the EU project "Phablabs 4.0" are used. In addition, a new workshop will be designed which will integrate the technology of the participating company partner, ams AG, into a new photonic demonstration device. The aim is to give young people an insight into the hightech applications of photonics, to get enthusiastic about scientific and technical issues in a playful way and thus to lose the excessive respect for MINT research and high technologies.

Research Grant	7. Ausschreibung Talente Regional
Funding Authority	FFG
Partner	Institut für Hochfrequenztechnik/ TU Graz, Photonics Austria, ams AG, Fachhochschule Vorarlberg, Fachhochschule Technikum Wien, VS Wettmannstätten, LUHNA, Hertha Firnberg Schulen für Wirtschaft und Tourismus, BRG Schoren, VS Wallenmahd, NMS PH Stmk, BRG/BORG Lessinggasse, pGRG 15 SSND
Duration	06/2020–05/2022
IIM project team	Dr. Hans Peter Schnöll, Lukas Kreilinger, Manuel Lesser

Voladigital

SMEs are currently facing major challenges such as increasing uncertainty and volatility. Digitization and agility offer numerous opportunities but require new competences of the industrial workforce. Currently, there is a lack in practical training courses that focus on digitization and/or agility. Learning factories and makerspaces offer effective hands-on learning environments. The aim of this research project is to create a training concept where participants can flexibly acquire theoretical knowledge on a learning platform and apply this knowledge in a learning factory and a makerspace. For this reason, a survey with Styrian SMEs will be carried out as a first step, on the basis of which a didactic concept will be developed and prototypically tested.

Research Grant	Steirischer Zukunftsfond
Funding Authority	Land Steiermark
Partner	ISDS TU Graz, University of Teacher Education Styria, Styrian SMEs
Duration	05/2020–04/2022
IIM Project Team	Maria Hulla, Patrick Herstätter

DigiCompGlass

The Project DigiCompGlass aims to develop modules for Virtual Reality trainings with a focus on small and medium sized enterprises (SMEs). This should enable SMEs to use Virtual Reality Technologies for training and education, with the advantage of relatively simple scaling and individualization possibilities. To properly assess the needs and requirements for the development for training of digitization competences of (low-skilled) production employees, an analysis is to be carried out as a starting point.

Research Grant	Projektfonds Arbeit 4.0 – Digifonds
Funding Authority	Arbeiterkammer Styria
Partner	Styrian SMEs
Duration	11/2021–10/2023
IIM project team	Patrick Herstätter, Maria Hulla

ExoFitStyria

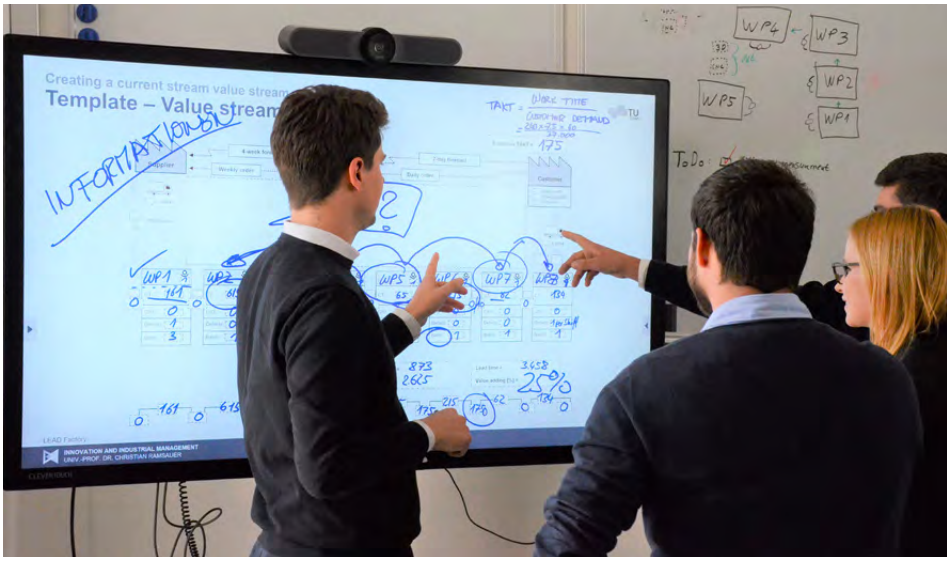
The project ExoFitStyria deals with how employees in Styrian industry can be kept longer and healthier in employment through innovative technologies. In particular, the technology of exoskeletons could make a significant contribution here if employees are familiar with it and use it regularly and purposefully. In this regard, a demand survey will be conducted among Styrian SMEs in the production sector (ÖNACE B-F) and different exoskeletons will be tested in a laboratory and several field studies. A training concept for the implementation of the right technologies for the right use cases will be developed and prototypically tested with Styrian SMEs.

Research Grant	Projektfonds Arbeit 4.0 – Digifonds
Funding Authority	Arbeiterkammer Styria
Partner	Styrian SMEs
Duration	09/2021–02/2021
IIM project team	Dr. Matthias Wolf

Transform.industry: Guiding the green transformation for Styrian SMEs

Achieving measurable sustainability within industrial operations is crucial in achieving the EU's medium- and long-term climate goals. Especially SMEs, which do not have dedicated employees for sustainability within the company, face significant challenges in meeting the legal requirements. This project will develop a guideline for SMEs, specifically industrial companies, in cooperation with representative selected companies, to implement GHG-balancing in combination with energy flow analyses in a practical, traceable, and transparent way. Based on the embedding into macroeconomic analysis, recommendations for the Styrian industrial policy will be derived.

Research Grant	The Green Transformation: Herausforderungen und Chancen
Funding Authority	Das Land Steiermark
Partner	Styrian SMEs
Duration	09/2021–02/2021
IIM project team	Dr. Matthias Wolf, Marion Unegg, Atacan Ketenci



P2-Opti

The automotive industry is currently undergoing a phase of high uncertainties (e.g. regulatory changes, diverse energy carriers, autonomous driving) leading to a vast variety of new and complex powertrain systems. Primary target of the P2-Opti project is to reduce time to market and total cost of ownership (TCO) for these powertrain variants by reducing the silos between development, production and operating phase. In terms of a production and lifetime oriented development process, comprehensive digitalization over the entire product lifecycle and Big Data analysis techniques are seen as a key enabler to achieve those targets. The methods and tools developed in seven work packages will be validated on the use case of an electrified powertrain architecture.

Research Grant	Production of the Future (Produktion der Zukunft)
Funding Authority	Austrian Research Promotion Agency (FFG)
Partner	AVL List GmbH
Duration	05/2017-04/2021
IIM project team	Christoph Sams, Oliver Moerth-Teo, Dr. Hans Peter Schnöll, Lukas Schwarz

EnableMe50+

The project aims to close the gap deriving from demographic change by addressing the specific needs of elderly workers. This is done by taking into account the three relevant dimensions of technology (digitalization), organization and humans. In order to meet the changing needs of an aging workforce, specific measures involving different methods and (new) technologies need to be implemented in existing industrial work settings. In particular, the technological progress offers new opportunities for supporting elderly workers, for example with physical assistance systems. Based on case studies, initial approaches for such generic measures are to be developed, implemented and evaluated in the IIM LEAD Factory as well as at the partner companies. With these insights, a holistic methodology to empower elderly workers in industry will be developed.

Research Grant	Bridge programme
Funding Authority	Austrian Research Promotion Agency (FFG)
Partner	Rosenbauer International AG, REWE International AG, Institute of Work Research and Work Policy at the Johannes Kepler University Linz
Duration	07/2017-07/2020
IIM project team	Dr. Matthias Wolf, Dr. Mario Kleindienst

MI&R

Enforcing Innovation across Maker, Industry & Research (MI&R) is a research project, supported by the Austrian government. Makers can be anybody who likes to put ideas into reality and build physical objects. Companies are constantly searching for new business ideas. Research organizations such as universities provide new research results in labs. The “maker community” at universities can be a new source of ideas to develop new products and services. Makerspaces are locations where product developers from companies get in touch with the maker spirit of students and other makers. The goal of the project is to develop strategies and methods to enable and enforce the cooperation of makers, industry and research. To do so, a makerspace, the new Schumpeter Laboratory for Innovation was planned, built and put into service in November 2018.

Research Grant	Hochschulraumstrukturmittel (HRSM)
Funding Authority	Austrian Federal Ministry of Education, Science and Research
Partner	Andritz, AVL, Energie Graz, Orasis, Knapp, Rosendahl Nextrom, Logicdata, Magna Steyr Fahrzeugtechnik, Miba, NXP, OMV, Pankl, Remus-Sebring Group, Ventrex, Voestalpine
Duration	1/2017–12/2019
IIM project team	Dr. Hans Peter Schnöll, Dr. Thomas Böhm, Matthias Friessnig, Thomas Wildbolz, Patrick Herstätter, Andreas Kohlweiss and Lukas Kreilinger

PHABLABS 4.0

The concept of PHABLABS 4.0 is based on combining the world of photonics with the growing creative ecosystem of existing FabLabs. Bringing together experts from 13 European photonics institutes and STEM-oriented organizations with FabLab stakeholders, PHABLABS 4.0 will deliver 33 photonics workshops, 11 photonics challenger projects and photonics toolkits tailored for three different target groups, young minds (10-14 years), students (15-18 years) and young professionals (>18 years). The IIM together with Joanneum Research is one of the 13 partners developing workshops in the field of photonics with a focus on light and LEDs. All the workshop concepts developed are tested by people of different ages (in total about 120 people) within the new FabLab and the Schumpeter Laboratory for Innovation, in order to get feedback about the applicability of the ideas.

Research Grant	Horizon 2020/Research and Innovation programme
Funding Authority	European Commission
Partner	Joanneum Research and 12 other European Partners
Duration	12/2016–05/2019
IIM project team	Lukas Kreilinger, Christoph Pirklbauer, Manuel Lesser and Dr. Matthias Friessnig

Smart Scooter

In 2007 for the first time in human history, more than 50% of the world population lived in cities. Crowded public transportation, bad air quality, limited parking areas and increasing traffic are only some issues cities are facing due to the trend of urbanization all over the world. The “last mile” problem of public transportation has not been solved yet. Smart scooters in combination with opportunities offered by digitalization could help to develop new commuting strategies for urban areas to overcome some of the above mentioned challenges.

Research Grant	Sponsorship
Funding Authority	Dr. Wolfgang Porsche Foundation
Duration	1/2017-06/2018
IIM project team	Dr. Mario Kleindienst, Dr. Alexander Pointner, Dr. Hugo Karre and Maria Hulla

KoRe

The purpose of this project was to assess and optimize the Electric Energy Storage Systems (EES) of electrically driven motorcycles with a particular emphasis on safety factors, lightweight design and cost saving as well as improvement opportunities to support the development process. Today, battery cells used in motorcycles allow for a certain amount of deformation without serious damage depending on the direction of loading. The results of this project were important for strategic decisions on whether future EES-concepts should be designed in a way to allow a certain uncritical amount of deformation, in order to save weight and costs while maintaining a sufficient safety margin.

Research Grant	Cooperative research and development project
Funding Authority	Austrian Research Promotion Agency (FFG)
Partner	Vehicle Safety Institute, TU Graz; KTM Sportmotorcycle AG
Duration	09/2014-08/2016
IIM project team	Dr. Hans Peter Schnöll, Dr. Thomas Böhm and Thomas Atzlinger

FlexHEP

Project FlexHEP aimed to bridge the research fields of Innovation and Operations Management by putting particular emphasis on the transfer of new products from research-intensive development to stable and efficient large-scale production. In close cooperation with Plansee SE in Reutte (Tyrol), a global leader in the field of powder metallurgy, operational challenges were investigated that occur during the production ramp-up of advanced materials and components for high-end applications in global markets. The overall goal of FlexHEP was to develop and successfully implement new tools that improve ramp-up performance in materials industries and thus provide the industrial partner and similar Austrian companies with a competitive edge.

Research Grant	General program (Basisprogramm)
Funding Authority	Austrian Research Promotion Agency (FFG)
Partner	Plansee SE
Duration	05/2015-05/2018
IIM project team	Dr. Martin Kremsmayr, Dr. Alexander Pointner

Smart Factory

The goal of the project was to develop a “Smart Factory” for a small electric driven commercial vehicle. The vehicle called “Eli” developed by SFL technologies GmbH was just in a prototype stage at the beginning. The task was to develop a factory using mass customization principles enhanced by digital production facilities to produce up to 2,000 cars a year. The official start of production was in March 2017.

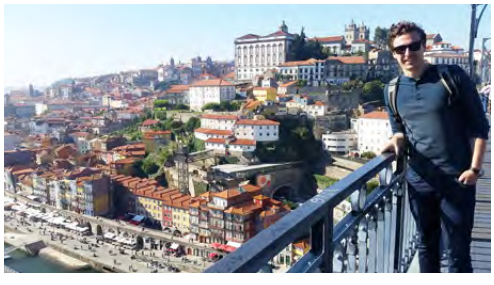
Research Grant	Voraus!denken
Funding Authority	Styrian Research Promotion Agency (SFG)
Partner	SFL technologies GmbH
Duration	4/2015-12/2015
IIM project team	Dr. Mario Kleindienst, Martin Jungreithmair, Dr. Markus Brillinger and Daniel Stöffler

Large-scale 3D printer "BigRep ONE" at FabLab I

RESEARCH ACTIVITIES ABROAD

University of Porto

Dr. Alexander Pointner spent the summer of 2016 at the University of Porto (Portugal) which focuses on applied science especially in the area of product development and design thinking. At the Porto Design Factory, he conducted research on topics related to his PhD thesis and he also supported the organization of the Product Development Project, which is similar to the Product Innovation at the IIM Institute.



Karlsruhe Institute of Technology

In summer 2021, Maria Hulla was invited by Prof. Gisela Lanza of the wbk Institute of Production Science of the Karlruhe Institute of Technology. There, she conducted research on the competency development for the digital transformation of SMEs. Moreover, she worked on projects in the learning factory for global production.

Copenhagen Business School

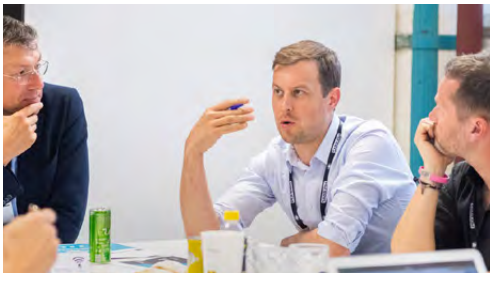
In spring 2017, Dr. Martin Kremsmayr was invited to conduct a three-month research stay at Copenhagen Business School (CBS) in Denmark. In 2015, CBS was ranked among the world's top 10 universities for business and management. Dr. Kremsmayr was hosted by the Department of Operations Management, where Prof. Christer Karlsson served as his academic mentor. During his stay, he was working with Danish research colleagues on topics related to his PhD project.

Aalto University in Helsinki

In summer 2014, Dr. Hans Peter Schnöll spent four months at the Aalto Design Factory in Finland to focus on his PhD research project related to agile product development. He was invited by Prof. Kalevi Ekman, an expert for integrated product development. Dr. Schnöll maintained the relationship with our academic partner in the Product Innovation course.

Hamburg University of Technology

In summer 2017, Dr. Thomas Böhm spent three weeks at the Hamburg University of Technology. On the invitation of Prof. Cornelius Herstatt, he had the opportunity to discuss his research with the staff at the Institute of Technology and Innovation Management. He also visited the new innovation space "collabor8" at the Otto campus and spent time at other Maker-spaces in Germany (Adidas in Herzogenaurach, Siemens in Munich and Erlangen and Airbus in Hamburg) to gain insights into different operation models of corporate makerspaces.



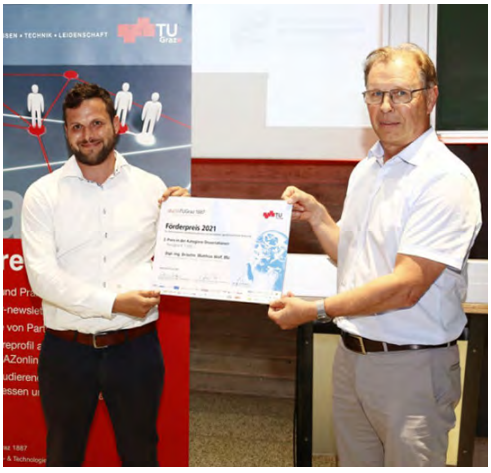
Technical University Darmstadt

In spring 2019, Dr. Matthias Wolf spent one weeks at the Darmstadt University of Technology. On the invitation of Prof. Ralph Bruder, he had the opportunity to discuss his research with the staff at the Institute of Ergonomics. He also visited several labs dealing with ergonomic topics to gain insights into different current topics within this scientific field. In return colleagues from TU Darmstadt visited the IIM Institute and participated in a workshop in the LEAD factory in autumn 2019.

SCHOLARSHIPS AND AWARDS

Promotion Award of the Forum Technology and Society

Many final theses in technical studies (doctoral thesis, master's theses) have high societal and/or social relevance, which is to be made more publicly visible with the award of the sponsorship prize. Dr. Matthias Wolf received the 3rd place price on the 28th of June, 2021 for his doctoral thesis “Counteracting demographic challenges in industrial blue collar work”.



Industrial Management Thesis Award

The Industrial Management Thesis Award was given to Dr. Stefan Heldmann in 2018 and to Dr. Matthias Wolf in 2020. The award, donated by the “Verein zur Förderung der Betriebswissenschaftlichen Forschung und Ausbildung”, is aimed at outstanding industry-related doctoral thesis at the interface between business and technology and was presented by Prof. Wilfried Sihn at a ceremony at TU Wien.

Mind the Gap Award TU Graz

In October 2017 and 2020, Dr. Matthias Wolf was awarded a Gender and Diversity Grant at Graz University of Technology. He received the award for his scientific publication “Current and Future Industrial Challenges: Demographic Change and Measures for Older Workers in Industry 4.0” and his doctoral thesis, respectively. This award was also handed over to former student support and Master thesis student Elma Sadaj in 2019 for her thesis.

Award at RWTH Aachen

Dr. Martin Kremsmayr was awarded the Best Paper Award at the 3rd International Conference on Ramp-Up Management (IRCM) in 2016. The conference was hosted by RWTH Aachen University and sponsored by the International Academy for Production Engineering (CIRP) and the German Research Foundation (DFG).

Scholarship for the Alpbach Summer School on Entrepreneurship

In summer 2015, Dr. Christian Rabitsch, Dr. Alexander Pointner and Dr. Martin Kremsmayr received a scholarship for the Alpbach Summer School on Entrepreneurship hosted by the European Forum Alpbach in cooperation with the University of Cambridge. The researchers pitched their business ideas to a number of investors and domain experts. A ticket for the Technology Symposium at the European Forum Alpbach 2015 was also included in the scholarship.

Scholarship for the internationalization of Techno-Economics

In February 2013, Dr. Hans Peter Schnöll received a scholarship which allowed him to work on his doctoral thesis in cooperation with international researchers at the Aalto Design Factory (Helsinki, Finland). The work of Dr. Schnöll focused on the integration of product and process innovation in the context of fiber reinforced plastics. The research grant was awarded by the Institute of Economic and Business Management at Montanuniversität Leoben and sponsored by AMAG AG, Magna International Europe AG and voestalpine AG.

FSI scholarships sponsored by MAGNA

Magna International Inc. set up a merit-based scholarship program, in order to support excellent achievements of Master and PhD students at the Frank Stronach Institute (FSI). Thereby, in addition to the academic track record and the scientific value of the student's work, a particular focus is put on the practical relevance. The criteria are finally judged by the FSI Advisory Board consisting of representatives from industry and academia.

Between 2012 and 2018, the following 24 IIM students received the FSI scholarship:

2018
Martin Goldberger
Patrick Herstätter

2017
Stefan Puschnigg
Dr. Alexander Pointner (PhD)
Dr. Martin Kremsmayr (PhD)
Dr. Stefan Heldmann (PhD)
Dr. Thomas Böhm (PhD)

2016
Dr. Hans Peter Schnöll (PhD)
Dr. Christian Rabitsch (PhD)
Phillip Berner

2015
Stefan Redl
Thomas Tscherner
Siegfried Sharma (PhD)
Christian Jungmair

2014
Peter Oswald

2013
Julia Pfanzeltner
Philipp Gumpl
Patrick Schatz
Philipp Weiss
Dr. Matthias Friessnig

2012
Jürgen Radl
Dr. Bernd Kleindienst
Jakob Hürner
Dr. Heinz Hösch

STAFF TRAINING & DEVELOPMENT

Case study method teaching seminar at Harvard Business School

Starting on August 17, 2018, Maria Hulla and Andreas Kohlweiss participated in a two-day seminar on the case study teaching method at the Harvard Business School in Boston (USA). The focus of the seminar was on leading discussions in larger groups. Supervised by active Harvard professors, the seminar illustrated how to successfully promote active group discussions in a real case study setup. It was a great experience for Maria Hulla and Andreas Kohlweiss to slip into different roles and have discussions amongst peers from top American universities such as Harvard, MIT or Yale. Additionally, they benefited from the impressions and unique spirit of the Harvard campus environment.

Assistants at the institute involved in teaching should participate in Harvard case study training. Besides Maria Hulla and Andreas Kohlweiss (Boston 2018) the following members of the IIM have also participated in trainings organized by Harvard Business School:

Oliver Moerth-Teo (online, 2021)
Elias Auberger (Boston, 2019)
Thomas Wildbolz (Boston, 2019)
Dr. Matthias Wolf (Boston, 2019)
Patrick Herstätter (Boston, 2019)
Dr. Hugo Karre (Boston, 2017)
Dr. Thomas Böhm (Frankfurt, 2016)
Dr. Matthias Friessnig (Frankfurt, 2016)
Dr. Hans Peter Schnöll (Oslo, 2013)
Dr. Alexander Pointner (Oslo, 2013)

VDI Value Manager certification

The VDI Value Manager training requires three modules to be completed, in order to receive the designation “Value Manager”. Students have the opportunity to receive the certification for module 1 and 2 after successfully completing the Value Management (VM) courses offered by the IIM. Participating in the course Value Management students get to know the basics of VM and are able to request the VM module 1 certificate afterward. In the subsequent course “Design to Value” the students have to participate in a VM-project regarding a given problem. By successfully completing the project, the participants can request the VM module 2 certificate. Further training for the module 3 is conducted by an external expert and hold for request, if there are enough participants.

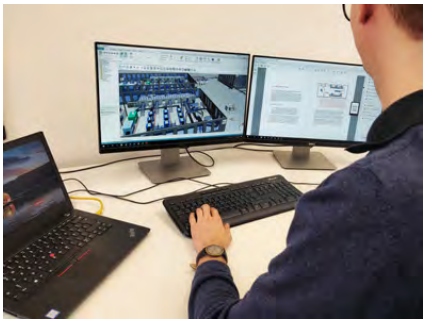
In general, there is a long tradition in VM at the IIM Institute. The first PhD thesis on Value Management in German-speaking countries was written at the institute in the 1960s. To supervise Master theses and to support industrial projects, several members of the IIM participated in the VM training process:

Andreas Kohlweiss (2018)
Dr. Hans Peter Schnöll (2014)
Dr. Thomas Böhm (2014)
Dr. Mario Kleindienst (2014)

Tecnomatix Plant Simulation training

Plant Simulation is used in projects of the IIM dealing with material flow analysis and layout planning. By using the simulation software, it is possible to create digital models of a logistic system such as a production network. This allows simulating, analyzing, visualizing and optimizing production systems and processes, the flow of materials as well as logistics operations. What-if scenario analysis and experiments are possible without disturbing existing production systems.

From the 7th until the 9th of May 2018, the scientific assistants of the working group Industrial Management, Maria Hulla, Dr. Matthias Wolf, Elias Auberger and a Master student took part in a training on Siemens Technomatix Plant Simulation held by the consulting company SimPlan. During the first two days of the training the participants where taught basics about Plant Simulation and object-oriented programming with SimTalk. The last day was used to take a look at the individual problems and to practice special exercises.



INTERNATIONAL CONFERENCE ON LEARNING FACTORIES 2021

Hybrid

The 11th international Conference on Learning Factories 2021 took place from the 1st to the 2nd of July 2021 as a hybrid meeting (partly physical, partly online) and was organized and hosted by the Institute of Innovation and Industrial Management of Graz University of Technology.

Direction of the live stream of the panel discussion

Vice-rector Horst Bischof and Dr. Kai Brüggemann
at the panel discussion

More than 140 participants from 26 different countries – amongst others Brazil, Canada, Singapore, Portugal and South Africa – attended. On the first conference day, the opening with presentations of the Conference Chair Prof. Christian Ramsauer, Rector of TU Graz Harald Kainz and Dean of the Faculty of Mechanical Engineering and Business Economics Franz Haas was the first point on the agenda.

After that, Laurence McHauser (Partner at McKinsey & Company, London) performed a very insightful keynote on "Weapons for Training". Based on this presentation, Gerald Hofer (CEO at Knapp AG), Dr. Kai Brüggemann (Managing Director at ÖBB-Technische Services GmbH), Dr. André Walter (Chairman of the Board of Management of Airbus Operations GmbH and head of Plant Hamburg), Laurence McHauser and Prof. Christian Ramsauer debated in the panel discussion with the title "Learning Digital Transformation" about how learning factories are able to promote the digital transformation in industrial companies.

At the general assembly of the International Association of Learning Factories (IALF) new members were welcomed, projects discussed and working groups were presented to the audience.

Above of that Prof. Christian Ramsauer was elected as the new president of the IALF for the next two years, taking over from Prof. Joachim Metternich (TU Darmstadt). ▸

Keynote of Prof. Thomas Gries of RWTH Aachen on "Rethinking Supply Chains 4.0"

In 2021, the University of Alberta (Canada), the Free University of Bozen-Bolzano (Italy), the University of Twente (Netherlands) and Politecnico di Milano (Italy) joined the IALF.

The second conference day started with a keynote on „Rethinking Supply Chains – Industry 4.0 & Circular Economy“ of Prof. Thomas Gries (RWTH Aachen). After that Prof. Wilfried Sihn (TU Wien) and Prof. Eberhard Abele (TU Darmstadt) were honored as the initiators of the IALF and the CLF including a speech of Prof. Jürgen Kluge.

During the two conference days, 90 interesting presentations in the tracks “Teaching and Training in Learning Factories”, “Digital Technologies in Learning Factories” and “Mixed Reality and Learning Factory concepts” took place. Throughout, 15 paper sessions and 3 poster sessions, there was time for insightful discussions. In between the agenda points, participants were encouraged to network. Moreover, guided tours of the learning factories of TU Graz and the Knapp Service Factory were presented.

Former IALF President Prof. Joachim Metternich and former General Secretary Antonio Kreß (TU Darmstadt)

IALF Website

Prof. Christian Ramsauer at the honoring of Prof. Eberhard Abele and Prof. Wilfried Sihn handing over the symbolic foundation stone

Papers and posters are published open-access in Elsevier´s online SSRN. According to the feedback of the participants, the conference was overall a great success. The 12th CLF will be held in Singapore from the 12th to the 13th of April 2022.

The conference ended with social activities at the Buschenschank

INTERNATIONAL CONFERENCE ON LEARNING FACTORIES 2020

Online

- 35 h of video conference and 136 tons CO_2 savings on flights compared to a physical conference in Graz, Austria

  (An average citizen in Europe emits 7 tons CO_2 per year)

  Based on Carbon Foodprint for expected flights when taking the nearest airport to home university to Graz Airport

F A C T S

120 Abstract Submissions
90 Accepted Papers
165 Participants
28 Countries
96 Speakers

> What are the latest developments in the field of learning factories? How can the Internet of Things and Mixed Reality be usefully applied in production environments?

These questions were discussed at the Conference on Learning Factories (CLF) 2020 – organized by the IIM Institute.

Since 2011, the international CLF has been held annually and is the most important event in the field of learning factories. In recent years, the CLF has been organized by the Technical University Munich, the Norwegian Institute of Science and Technology and the Technical University Darmstadt, among others.

The 10th CLF was organized by the IIM and took place from the 16th to the 17th of April 2020. The conference marks the first international, academic conference hosted by the IIM. However, due to the COVID-19 situation the conference had to be held virtually. More than 160 people from 28 different countries, including Mexico, Canada, Singapore, Thailand and Greece, attended the conference. The CLF was introduced by the general assembly of the International Association on Learning Factories (IALF). The IALF is a group of research institutions that operate learning factories. The association's goal is to promote cooperation among its members to achieve excellence in teaching and research in the field of manufacturing engineering and production management through learning factories. In 2020, the Tongji University (Shanghai, China), SIMTech (Singapore) and McMaster University (Ontario, Canada) joined the IALF.

On the first official conference day, the CLF was opened by the Vice-rector for Research of TU Graz Horst Bischof, who gave an overview on the latest insights of TU Graz. Moreover, Conference Chair Prof. Christian Ramsauer talked about the developments of the Conference on Learning Factories and the about the program of the upcoming two conference days.

During the CLF, 90 papers were presented and after each presentation there was time for discussion with the audience. The topics of the presentations were mainly related to the fields of Mixed Reality, interdisciplinary learning and the Internet of Things in learning factories. It has to be pointed out that concepts and developed technologies presented had a high degree of novelty and advance the research in the field of learning factories.

The IIM staff also presented the latest research results regarding the LEAD Factory. Among other topics, they dealt with the development of a Tear Down Lab, an Augmented Reality application and energy monitoring. For the first time poster sessions were held at the CLF, during which mainly learning factory concepts were presented. The participants' contributions were published in a special volume of Procedia Manufacturing of Elsevier and are freely accessible via Science Direct. According to the positive feedback of the participants, the conference was a great success despite the unusual circumstances.

> “The organization worked smoothly and was – as some participants reported to me – much better and more stable than other conferences of a similar kind that had been held before. Really great!”
>
> Prof. Joachim Metternich
> (Former President of the International Association of Learning Factories)

THE LEARNING FACTORY EXPERIENCE

A learning factory conveys experience-based learning by reproducing an abstracted real-life environment that stimulates learner's coginition by challenging them with a concrete, practical problem situation. The learning factory experience brings together theory and practice, incorporates emotional aspects and various environmental factors that add to the learning process.

CORE TOPICS OF THE IIM LEAD FACTORY

The learning factory at the IIM Institute focuses on LEAD: Lean management, Energy efficiency, Agile operations and Digitalization.

L

LEAN MANAGEMENT

Lean thinking, in short, is about eliminating waste (transport, inventory, motion, waiting, overproduction, overprocessing, defects) in order to maximize value. To capture the full potential of Lean, not only systems and processes are of special interest. The key challenge for a successful implementation and driving lean production resides in the skills of employees operating those processes.

E

ENERGY EFFICIENCY

Production can be improved at several factors related to energy or resource productivity. Besides minimizing energy use, emphasis is put on raw material, emissions and water including topics such as recovery of materials and recycling. The challenge to optimize variable costs for materials, energy or water while taking operational objectives like throughput or quality into account requires a certain mindset and specific capabilities.

F A C T

Video:
LEAD Factory

"Tell me and I forget. Teach me and I may remember. Involve me and I learn."

BENJAMIN FRANKLIN

A

AGILE OPERATIONS

The concept of agility from a manufacturing enterprise's point of view is about adapting to change and thrive on it. Agility is the capability of a company to prepare proactively for uncertainties and react quickly to changes to optimize the economic situation by leveraging the whole value chain. Consequently, agility capabilities are needed in an organization to develop a competitive advantage and to respond to the increasing uncertainties positively.

D

DIGITALIZATION

Digitalization leads to an increase of productivity enabled by smart, connected products. Industry 4.0 enables especially the potential of new business models, increasing resource productivity and increasing value-chain efficiencies. However, technology is most successful when it is integrated with process improvements. Besides organizational change, leadership and a clear vision, processes and skills supporting the "how" rather than the "what" are necessary. ▶

T O R Y

Individual parts of the TU Graz
scooter assembled at the LEAD Factory


INNOVATION
AND INDUSTRIAL
MANAGEMENT

RESEARCH CONTRIBUTIONS 1/2

PhD theses

HIGHLIGHTS

▶ Wolf, M. (2020): Counteracting demographic challenges in industrial blue collar work

The demographic change leads to a change in the number and composition of the European workforce. In the near future fewer and on average older workers will have to perform the same amount of industrial blue collar work. Therefore, companies have to adapt their workplaces for the changing prerequisites and needs of elderly workers and provide a higher number of age-appropriate designed workplaces. However, there is a lack of knowledge considering the design of such workplaces in scientific literature and industrial practise, where this thesis adds a new methodology and industry tailored tools. Developed and evaluated with two different Austrian industrial companies the new methodology to identify critical workplaces and adapt them by the use of physical assisting systems includes five steps from the identification of age-critical work stress, over the selection of a suitable ergonomic intervention method or technology, to the implementation and evaluation of the intervention´s benefits for the workers. Tested with the selected technology of exoskeletons, the results of applying the methodology justify that it provides a better basis for improved risk analysis, intervention selection and measure implementation support for industrial practitioners and thus enables to counteract demographic challenges in industrial blue collar work.

Number of PhD theses completed

13

▶ Rabitsch, C. (2016): Methodology for implementing agility in manufacturing companies

Today's market environments are very dynamic with volatility and uncertainty at an all-time high. Agility can be seen as a potential solution to master these challenges by enabling quick and adequate adaptations. However, as it has not been fully understood how to build agility into operations, this thesis presents a methodology to support managers implementing agility in manufacturing companies. Containing eight major steps, this methodology ranges from the identification of relevant change drivers and their integration to consistent change scenarios to the identification of feasible solutions aligned to corporate strategy. It finishes with updating the process in sync with the rate of change as well as the set-up of strategic control and performance measurement. Furthermore, agility governance was introduced as an organizational body coordinating all relevant activities across involved stakeholders. While the methodology was prototypically applied at a European contract manufacturer for automobiles in two selected use cases, a qualitative empirical method showed its applicability for other companies from different industries.

▶ Heldmann, S. (2018): Big data analytics for the volatile world – New methodology and proof of concept for sales forecasting in an industrial case study

The increasing volatility and uncertainty in today's business environment results in growing difficulties for companies to anticipate future changes. As companies consider big data analytics (BDA) as a new source of competitive advantage in such environments, this work presents a methodology to decide where to use BDA in order to gain a better understanding of the volatile business environment and an application for sales forecasting. Built and evaluated during a case study with a European manufacturer of printed circuit boards, the methodology consists of five steps. Starting with the initial business understanding step that combines the concept of agility with the idea of BDA, the second step is dedicated to the identification, assessment and selection of data sources. The remainder steps including data understanding, data preparation, and modeling & evaluation were specifically designed towards the sales forecasting use case. The case study confirmed the effectiveness of the methodology, whereas the best performing classifier achieved an accuracy of up to 85% and the selected regression model outperformed the standard forecasting approach.

▶ Schnöll, H. P. (2015): Integrated Product Development – A process model for the context-specific design of the product development process of components made of fiber-reinforced plastics

The product development process of components of fiber-reinforced plastics (FRP) is strongly influenced by the interaction of used materials, the design of the components and the manufacturing process. In order to control the resulting complexity, this thesis deals with the context-specific organization of product development processes of components made of FRP considering the aspects of integrated product development. Based on the understanding of related fundamentals and the results of analyzing an industrial case study, a process-model was derived to support the management of identified challenges. Focused on the primary goal of ensuring effectiveness and efficiency in the product development process, the key element of the process model is the project analysis to derive the right choice of the project type. Finally, guideline-based expert interviews were used to verify the applicability and practicability of the model. The results showed that the process model supports a proactive design of the product development process of components made of FRP, depending on the requirements of the customer to the product, the company's existing solutions as well as the general project conditions.

▶ Unzeitig, W. (2014): Method to consider uncertainties during the early phase of planning a factory

While planning a factory, the responsible expert faces uncertainties related to information about the product, production, process and resources. In order to prevent an underestimation of resulting risks, this thesis presents a method to deal with uncertainties during the early phase of factory planning and includes the consideration of linear dependencies between the dimension parameters staff, area and means of production. While the first element focuses on calculating the correlations of the dimension parameters for a specific factory, the second element implies the quantification of related uncertainties. In the last step, the risk is aggregated to diverse cumulative risk functions including the correlation effects. Diverse graphical analyses and key figures are provided in order to estimate and minimize the risk of a specific planning project. Finally, the data of a European contract manufacturing company for complete vehicles were used to verify the mathematical models and validate the developed method. The results justify that this method provides a basis for improved risk analysis during factory planning, which prevents an underestimation of risk.

ONGOING

Auberger, E.: Systematic approach for agile manufacturing network planning

Böhnke, N.-C.: Purchasing strategies at the category level – Exploring strategy formulation processes at an automotive manufacturer, Project partner: BMW Group

Herstätter, P.: Reducing barriers for the use of AR/VR for product development in SMEs

Hulla, M.: A learning factory based training for the required competencies in a digital and volatile business environment for SMEs

Ketenci A.: Design of economically and ecologically supply chains under consideration of uncertainties

Kohlweiss, A.: Reduction of Innovation Barriers across Maker, Industry & Research @ Academic Makerspaces

Kulmer, F.: Agility improvement through the application of machine learning algorithms in manufacturing companies

Moerth-Teo O.: Design for Lifecycle-Uncertainties- Guideline for the conceptual design of powertrain systems and their elements that enhance coping with uncertainties throughout the lifecycle

Preising, H.: Implementation of manufacturing network changes and ongoing network coordination using discrete event simulation and a transparent performance measurement system combining a holistic strategic view with operational aspects

Rüdele, K.; Development of a framework for ecologically sustainable production systems

Unegg, M.: Environmental sustainability – Developing a tool box for traceable sustainability in companies

COMPLETED

2021 Karre, H.: How to cope with uncertainty in operations

2020 Wolf, M.: Counteracting demographic challenges in industrial blue collar work, Project partner: REWE International, Rosenbauer AG

2019 Friessnig, M.: The role of the Maker Movement in product development

2018 Böhm, T.: Corporate Makerspaces – Operation Models, Implementation and Contribution to Organizational Learning

Heldmann, S.: Big data analytics for the volatile world – New methodology and proof of concept for sales forecasting in an industrial case study, Project partner: AT&S Austria Technologie & Systemtechnik AG

Kremsmayr, M.: From Lab To Scale – Managing production ramp-up in advanced materials industries, Project partner: Plansee SE

Pointner, A.: Synchronizing Production Capacity with Market Demand Upswings in a Lean Production System

2017 Hammer, M.: A time-based and analytic-supported management approach for resource-productive operations

Kleindienst, M.: Digitization in manufacturing industry – A systemic approach to align digitization with corporate strategy in small and medium-sized enterprises

2016 Rabitsch, C.: Methodology for implementing agility in manufacturing companies, Project partner: Magna Steyr Fahrzeugtechnik AG & Co KG

Schurig, M.: Methodology to Evaluate the Agility of a Production Network Using a Stress Test Approach, Project partner: Magna International Inc.

2015 Schnöll, H. P.: Integrated Product Development – A Process Model for the Context-specific Design of the Product Development Process of Components Made of Fiber-reinforced Plastics

2014 Unzeitig, W.: Method to consider uncertainties during the early phase of planning a factory, Project partner: Das Virtuelle Fahrzeug Forschungsgesellschaft mbH (ViF)

Master theses

HIGHLIGHTS

▶ Ketenci, A. (2019): Strategic site planning for the production of agricultural technologies, Project partner: Komptech GmbH

To cope with challenges like high capacity utilizations or increasing demands of products, a new manufacturing plant has been planned in Slovenia. The aim of this project was not only the elaboration and assessment of a LEAN-compliant production layout, but also a qualitative estimation of the impact of such a restructuring. To be able to identify weak points and derive optimization potentials of the existing layout, the production processes, the current and planned production program and the flow of materials were examined. This analysis served as the basis for the subsequent layout planning. Several different layout variants had been created and evaluated by the entire project team. The planned annual throughput for the year 2025 and the utilization of the technologies used were then visualized for the selected variant by means of a simulation, which has also been used for an in-depth analysis of the high lot sizes. As a conclusion, a qualitative estimation of production costs and usage potentials of the existing plant were drawn.

▶ Diess, A. (2017): Operative risk management in automotive ramp-ups, Project partner: Volkswagen AG

Shortened product lifecycles in the automotive industry have increased the importance of production ramp-ups significantly. However, due to increased outsourcing, OEMs do not fully control the ramp-up's success anymore and serial delivery release is not always granted. Therefore, this thesis addresses operative risk management in automotive ramp-ups. Starting with an analysis of existing approaches, an operative risk management methodology focusing on the serial delivery release of parts was developed and implemented in the production ramp-up of the Volkswagen T-Roc at the production plant Autoeuropa. This methodology consists of a framework defining the integration into the organization, the operationalization in the form of a process as well as an Excel-based tool to support the process steps risk identification, risk assessment and risk treatment. The implementation of the methodology resulted in a decrease of critical parts and risk of rework through preventive measures. For all parts without a serial delivery release, measures in the form of rework and exemption permits ensure the fulfillment of the ramp-ups production targets.

Number of Master theses completed

144

Atzlinger, T. (2016): Value Engineering at Electric Energy Storage Systems for E-Bikes, Project partner: KTM AG, VSI (TU Graz)

The role of electrically driven motorcycles in offroad-motorsports has gained importance due to several benefits such as low noise, simple use and environmental friendliness. This thesis conducts a value analysis (ÖNORM EN 12973) of the energy storage of electrically driven motorcycles from KTM AG, focusing on safety, lightweight design and cost. Scientifically supervised by the Institute of Innovation and Industrial Management, also the Vehicle Safety Institute of Graz University of Technology was involved in this thesis. KTM offers three electrically driven motorcycles, all powered by the same energy storage called "PowerPack". Having defined the initial situation, a workshop was carried out in order to identify the functions of the energy storage and their individual performance levels. Based on these results, numerous ideas to improve the PowerPack were developed and subsequently assessed regarding their feasibility and potentials for improvements. In a final step, a concept for a new generation of energy storages was developed by combining the most promising ideas. This thesis also supports the development process of future energy storages at KTM.

Santner, D. (2014): Product differentiation – A step towards entry level products at Anton Paar GmbH, Project partner: Anton Paar GmbH

When appropriately implemented, cost advantage over competitors or differentiation from them are two strategies to operate a business successfully. However, the implementation of both strategies has become challenging in all industries and business segments. This thesis deals with product differentiation based on a European company that manufactures measuring instruments. In this context, differentiation through constantly achieving higher accuracies remains successful as long as customers notice advantages and are willing to accept the resulting additional cost. Having reached the price limit of customers, new alternatives must be found. The change from manufacturing only high-level instruments to covering all segments in terms of accuracy and price is complex and requires large investments. Focusing on entry-level products, the identification of market potential is followed by the development of products as well as appropriate sales channels and service possibilities. Dealing with the identification of such a market potential and the elaboration of an adequate product concept, this thesis represents the first step towards the development of entry-level products.

▶ Zottler, M. (2014): Life-cycle analysis of lightweight concepts for automotive applications

Energy efficiency and the reduction of CO_2 emission are issues the automotive industry has been facing for years. Due to the increasing pressure to produce environmentally friendly vehicles, this thesis examines various lightweight body concepts for passenger cars in terms of their energy demand and CO_2 emissions during production as well as operation. Therefore, lightweight concepts made of aluminum and carbon fiber-reinforced plastics were compared with a reference variant made of steel. Based on a method of life cycle assessment (ISO 14040 and ISO 14044), the production processes of different body concepts were analyzed regarding their CO_2 emissions and energy consumption. Furthermore, the impact of the electricity mix of different countries on CO_2 emission and energy consumption in manufacturing was investigated. Finally, the effects of the lightweight concepts during operation as well as of the drivetrain concepts over the life cycle were investigated. Combining the results of the production and operation phase analysis demonstrates that using the selected lightweight concepts does not always lead to a reduction of CO_2 emissions over the entire life cycle.

ONGOING

Bek, B.: Increasing market shares by reducing lead times through the optimization of inventory and production planning, Project partner: Wertheim GmbH

Bhaskar, A.: Optimization of the Compressor Niche for central o-frost Appliance, Project partner: Liebherr Hausgeräte

Brückl, F.: Betriebliche Energieflussanalyse und Bewertung von Einsparungspotentialen, Project partner: Orasis Industries Holding GmbH

Leitgab, K.: Manufacturing network planning for the production of safes, Project partner: Wertheim GmbH

Maraz, D.: Worker guidance systems in the assembly line – Investigating the impact of hardware on process result and employee evaluation

Pirklbauer, C.: Makerspace 2025 – Conceptional design for corporate Makerspaces, Project partner: Fronius International

Scheder, N.: Wertanalyse eines permanenterregten Synchronmotors nach EN12973, Project partner: Elin

Trkulja, L.: Portfolio analysis of a special purpose machinery manufacturer, Project partner: Pewag engineering GmbH

Unterkofler, T.: Methodische gestütze Reduktion der Ausprägungsvielfalt von Teilbereichen eines Intralogistiklagers, Project partner: Knapp AG

COMPLETED

2021 Althuber, M.: Betriebliche Energieflussanalyse und ökonomische Bewertung von Einsparungspotentialen, Project partner: Komptech GmbH

Bernhardt, F.: Entwicklung eines Modells zur Betrachtung und Bewertung von Ausfallrisiken sowie deren Auswirkungen im logistischen Distributionszentren, um die logistische Agilität in einem ausreichenden Maß sicherzustellen, Project partner: Knapp AG

Grünbichler, I.: Analyse von Maschinendaten und Nutzungsmuster am Beispiel landwirtschaftlicher Zerkleinerungsanalgen, Project partner: Komptech GmbH

Kaponig, C.: Automatisiertes Linear Performance Pricing mittels Data Analytics, Project partner: AVL List GmbH

Krdzalic, A.: Virtual assembly workstation design and analysis for improvement of ergonomics and production performance, Project partner: Wertheim GmbH

Lang, A.: How to Cope with Technology Change in the Rail Transport?, Project partner: ÖBB-Technsiches Services GmbH

Perhofer, G.: Crisis management and ways to deal with changes resulting from a crisis by the practical example of Magna Presstec GmbH, Project partner: Magna Presstec

Rossmann, M.: Smart Locking System – Implementation of a central management system in the Schumpeter Laboratory for Innovation

Schulze, M.: Digital Factory in the sustainable textile Industry, Project partner: Vaude KG

Tratner, T.: Time series based studies with an IoT application in a learning factory

2020 Lukas, A.: Agile product development in the automotive industry, Project partner: AVL List GmbH

Mizelli, D.: Ableitung und Bewertung der Lokalisierungsstrategie von Fahrzeugprojekten in China, Project partner: Daimler AG

Preising, H.: Simulationsgestützte Neuplanung eines Fertigungslayouts zur Kapazitätssteigerung eines bestehenden Standortes für die Wartung von Schienenfahrzeugkomponenten, Project partner: ÖBB-Technische Services GmbH

Röhrenbacher, S.: Product cost estimation in the early development phase of powertrain systems, Project partner: AVL List GmbH

Römer, M.: Evaluation of CO_2 emissions in the production process of powertrain systems, Project partner: AVL List GmbH

Weger, F.: Assessment of product design principles supporting agile manufacturing, Project partner: AVL List GmbH

2019 Berger, M.: Value analysis of a rear axle steering (working title), Project partner: ZF Lemförder Achssysteme GmbH

Deshmukh, K.K.: Feasibility study for maximizing common parts strategy between MAN India and MAN Germany, Project partner: MAN

Judmaier, C.: Brownfield Layout Planning for the production of switchboxes, Project partner: ELSTA Mosdorfer GmbH

Jungreither,M.: Greenfield-Betriebsstättenplanung bei Alpen-Mykestag GmbH Materialflussanalyse und Layoutplanung, Project partner: Alpen-Maykestag GmbH

Kantar, B.: Agile Factory Planning Approach, Project partner: ÖBB-Technische Services GmbH

Karre, M.: Strategische Generalbebauungsplanung – Erstellen eines Konzeptes für die langfristige Grundstücksnutzung einer maschinellen Fertigung, Project partner: Umdasch Group

Ketenci, A.: Strategic Site Planning for the Production of Agricultural Technologies, Project partner: Komptech GmbH

Moser, D.: From prototype to series production – The challenges of the growing structure, Project partner: Rosenbauer International AG

Müller, S.: Concept development for utilization of operations data in value stream design and analysis for sheet metal forming production, Project partner: Palfinger AG

Rakos, T.: Correlation of Costs and Powertrain Functions in Early Development Phase, Project partner: AVL List GmbH

Sadaj, E.: Concept Design of a Learning Factory to Develop Customer Awareness for Service Products, Project partner: Knapp Systemintegration GmbH

Schweiger, D.: Hydrogen as a future market opportunity for valve technology companies, Project partner: Ventrex GmbH

Seufer-Wasserthal, L.: Optimization of packaging concepts for automated component feeding to an assembly line, Project partner: LogicData GmbH

2018 Auberger, E.: Brownfield layout planning for production of large-scale machinery, Project partner: Komptech GmbH

Brodtrager, C.: Increasing productivity by applying lean production in the automotive supplier industry, Project partner: Magna Steyr Fuel-Tec GmbH

Goldberger, M.: Goal Driven Redevelopment of a High-Dynamic Serial Compressor, Project partner: Ventrex Automotive GmbH

Herstätter, P.: Assisted process assurance and documentation in a small batch assembly of racing parts, Project partner: Pankl Racing Systems AG

Kohlweiss, A.: Cost analysis and functional optimization of an industrial shredder, Project partner: Komptech GmbH

Lautner, L.: Cost Optimization of a linear a linear actuator, Project partner: Logicdata GmbH

Müller, S.: Concept development for utilization of operations data in values stream design and analysis for a sheet metal forming production, Project partner: Palfinger AG

Nilesh, B.: An analysis of traditional shop floor management and new approaches with advent of Industry 4.0, Project partner: Hirschmann Automotive GmbH

Perner, P.: Smart additively manufactured components

Pickl, T.: Development of a product development format based on the analysis of hackathon concept, Project partner: Research and Technology House, TU Graz

Sallinger, A.: Simulation-based layout planning for the overhaul process of rail vehicle components, Project partner: ÖBB-Technische Services GmbH

2017 Berner, P.: Technology Screening – Development of a Structured Approach for the Early Identification of Emerging Technologies and Startups

Diess, A.: Operative risk management in an automotive production ramp-ups, Project partner: Volkswagen AG

Grgic, I.: Benchmark of Automotive Engines for Application on a Flight Engine, Project partner: BRP-Rotax GmbH & Co KG

Helmhart, M.: Standardization of bogie service for rail vehicle, Project partner: Siemens AG

Jungwirth, M.: Development and evaluation of a concept for the dynamic generation of customized work instructions, Project partner: Plansee SE

Klimentov, S.: Economic Study of a Solid Oxide Fuel Cell Combined Cooling, Heat and Power System, Project partner: AVL List GmbH

Kormann, A.: Standardisation of time modules for a holistic time allocation system, Project partner: Siemens AG

Lasshofer, R.: Material flow analysis and brownfield layout planning at ALPEN-MAYKESTAG GmbH, Project partner: Alpen Maykestag GmbH

Leitner, A.: Development of a Sensor System for Big Data Analysis in FabLabs

Plattner, P.: Development and testing of a standardized procedure for structured inspection planning and selection of inspection equipment in production ramp-up, Project partner: Plansee SE

Puschnigg, S.: Technology Evaluation and Assessment of its Impact

Radisic, O.: Process Stabilisation during Pre-Series Ramp-Up in Low-Volume Production Systems, Project partner: Rolls Royce Motorcars Ltd.

Sagar, M.: Supply Chain Network for Battery Electric Vehicles and Cost Model for Battery Packs, Project partner: AVL List GmbH

Stöffler, D.: Design of a Milk-run Supply Concept for the Assembly Line Production of an Electric Vehicle, Project partner: SFL technologies GmbH

Weinhandl, F.: Workshop Based Education Concept for Personal Skill Enhancement at DIY Labs

2016 Achatz, T.: Development of a method to estimate environmental health and safety costs in the tungsten powder production, Project partner: Wolfram Bergbau und Hütten AG

Atzlinger, T.: Value Engineering at Electric Energy Storage Systems for E-Bikes, Project partner: KTM AG, VSI (TU Graz)

Bäck, C.: Challenges and Potential Solutions for the Industrial Workforce of the Future, Project partner: Magna Powertrain GmbH & Co KG

Egger, M.: Analysis of the Theoretical Framework and Practical Applications of current Industry 4.0 Measures to support a Use Case

Foad, R.: Applying Agility in the Make and Plan Processes of the Semiconductor Supply Chain, Project partner: Infineon Technologies AG

Gaugl, J.: Business model generation and profitability analysis for an innovative football training system, Project partner: Anton Paar GmbH

Halawa, F.: Applying and Testing Hybrid Lean and Agile planning operations

Hofstätter, L.: Profitability Analysis of the Electron Beam Welding Process Using the Example of Large-scale Parts, Project partner: Voith GmbH

Jungmair, C.: Intra-company Logistics Optimization and Batch Traceability, Project partner: Ventrex Automotive GmbH

Ripota, T.: Lean Production of Agricultural Equipment – Analysis and Replanning of a Tractor Cab Assembly Line, Project partner: CNH Industrial Österreich GmbH

Schiffbänker, P.: Evaluation of Model-based Systems Engineering in the Traction Battery Product Development Process, Project partner: AVL List GmbH

Silli, A.: Development of a Modularization Concept and Product Configurator for an Innovative Normobaric High-Altitude Training System, Project partner: AMST-Systemtechnik GmbH

Wagner, T.: Disposition Concept for Increased Supply Chain Agility at Plansee HLW, Project partner: Plansee SE

Wolf, M.: Investigation of the need for action in the field of workplace related standardization caused by demographic change and Industry 4.0, Project partner: Johannes Kepler University Linz

Ziegler, C.: The Total Cost of Ownership Method as Evaluation Tool for Electrified Powertrains, Project partner: AVL List GmbH

Zettl, S.: Development of a Concept for Subsequent Implementation of Industry 4.0 Application within Automatic Storage Systems, Project partner: Knapp Systemintegration GmbH

2015 Gruber, L.: Feasibility study for biomass combustion plants in the power range greater than 300 to 500kW, Project partner: KWB – Kraft und Wärme aus Biomasse GmbH

Heinzle, P.: Agility in Production Networks, Project partner: Liebherr-International Deutschland GmbH

Hehenberger, A.: Design Thinking in the Product Innovation

Höller, C.: Technical and Economic Analysis of the Process of Surgical Bone Drilling and Improvement Potential, IWS (TU Graz)

Holzinger, D.: Greenfield Layout Planning, Project partner: Albin Sorger "zum Weinrebenbäcker" GmbH & Co KG

Hübler, M.: The measurability of physical and mental stress at work in vehicle assembly, Project partner: Magna Steyr AG & Co KG

Jungreithmaier, M.: Greenfield Layout Planning at Alpen-Maykestag GmbH, Project partner: Alpen-Maykestag GmbH

Karre, H.: How to Make (Almost) Anything – A Concept to Enhance the Maker Movement at Graz University of Technology, Project partner: IME (TU Graz), funded by Clever & Smart scholarship

Kicker, S.: Development and assessment of potential measures for energy cost savings at several locations in Austria, Project partner: Prof. Siegfried Wolf

Kranawetter, M.: Optimization of Additional Ramp-ups at Magna Steyr Fahrzeugtechnik, Project partner: Magna Steyr Fahrzeugtechnik AG & Co KG

Lettner, F.: Layout and Material-flow Planning for Ebbinhaus Styria Coating GmbH, Project partner: Ebbinghaus Styria Coating GmbH

Schachner, A.: Industry 4.0 in the frame bodyshell of Siemens AG, Project partner: Siemens AG

Schweiger, K.: Analysis of the project planning process and determination of optimization potential in the configuration of Andritz Automation Graz, Project partner: Andritz AG

Tokic, M.: Knowledge and Technology Transfer Pathways for Effective Exploitation of Intellectual Property at Universities, Project partner: Research & Technology House, TU Graz

Tscherner, T.: Impact of Product Design on Agile Manufacturing

Urch, T.: Development of an operator model for modern additive manufacturing technologies at the Graz University of Technology, Project partner: Magna Steyr AG & Co KG, Ventrex Automotive GmbH, IFT (TU Graz)

Wurzer, A.: Assessment of possible legal incentive effects based on a holistic life cycle analysis in the transport sector, Project partner: FTG (TU Graz), funded by Clever & Smart scholarship

Zainer, S.: Facility planning and working place analysis at the production site of Medienfabrik Graz, Project partner: Medienfabrik Graz GmbH

2014 Bittersohl, C.: Determination of Profitability Influencing Factors within a Sealing Production Process, Project partner: Angst & Pfister AG

Boyraz, A.: Time, Cost, and Quality Impact of Modularization on Alstom Combined Cycle Power Plant (CCPP) Projects, Project partner: Alstom (Schweiz) AG

Diethardt, R.: Evaluation of manufacturing technologies for cost reduction of a wind trubine and identification of insourcing opportunities, Project partner: wind2power GmbH

Fuchs, A.: Internal material flow planning and factory design of the Kendrion plant in Eibiswald, Project partner: Kendrion Binder Magnete Vertriebs-GmbH

Gumpesberger, I. G.: Market Study for Fully Automatic High-Performance Flour Bagging Machines, Project partner: Statec Binder GmbH

Kirchmeyr, T.: Analysis of Global Energy Market and Drivers of Investments for Energy Efficiency Solutions in the Iron & Steel Industry, Project partner: Siemens VAI Metals Technologies GmbH

Kleebauer, S.: Automotive trends from global platforms to industry toolkits and their impact on global suppliers like MAGNA, Project partner: Magna Steyr AG & Co KG

Kremsmayr, M.: Ramp-up Management in customer-specific contract manufacturing of powder metallurgically produced high-performance materials, Project partner: Plansee SE

Micheu, H.: Development of a teaching concept for practical teaching in the field of industrial management – The Learning Factory, Project partner: Institute for Production Engineering

Oswald, P.: Production technology requirements with respect to agile manufacturing, Project partner: Institute of Materials Science, Joining and Forming

Pfanzeltner, J.: Market Entry Consulting for Chinese Companies Going Global: DKSH Business Model Development Targeting the German Market, Project partner: DKSH Management Ltd.

Prüß, F.: Systematic Assessment of Future Propulsion Concepts for Large Engine Applications – Hybridization and Electrification of Ships, Locomotives and Mining Trucks, Project partner: AVL List GmbH

Reiterer, M.: Analyses and conception of the introduction of an energy monitoring- and/or energy management system for Wolfram Bergbau and Hütten AG at the site St. Martin im Sulmtal, Project partner: Wolfram Bergbau und Hütten AG

Santner, D.: Product Differentiation, A step towards entry level products at Anton Paar GmbH, Project partner: Anton Paar GmbH

Schöggler, C.: Market Analysis for 48 V Automotive Testbed Systems, Project partner: AVL List GmbH

Stock, M.: World Class Logistics in Operations – Definition of World Class Standards, Tools and Processes in the Material Flow, Project partner: Magna International Europe GmbH

Tatzer, G.: Unconventional Organization and Agile Manufacturing

Zeininger, H.: Important requirements for innovative assistance systems in manufacturing, Project partner: Xcessity Software Solutions

Zottler, M.: Life-cycle analysis of lightweight concepts for automotive applications, Project partner: FTG (TU Graz), funded by Clever & Smart scholarship

2013 Böhm, T.: Cost Assessment and Optimization in the Front-End of the Design and Development Process of a Motorcycle Engine, Project partner: Forschungsgesellschaft für Verbrennungskraftmaschinen und Thermodynamik mbH

Edegger, P.: Technical and Economical Feasibility Study of the Application of Shape Memory Materials in Car Seats, Project partner: Magna International Inc.

Friedl, E.: Influence analysis of elementary production factors on the cost structure of a Turbogenerator

Friessnig, M.: Sourcing of axle boxes for railway bogies, Project partner: Siemens AG

Gumpl, P.: Development of an After-Sales Strategy concept for Anton Paar GmbH, Project partner: Anton Paar GmbH

Hirschvogel, M.: Changes in the energy industry and their impact on the global automotive supplier Magna, Project partner: Magna International Inc.

Hösch, H.: Analysing monitoring tools for technology development projects in an industrial enterprise, Project partner: ACC Austria GmbH

Nußbaumer, J. P.: Assessment of charging stations for electric vehicles, Project partner: Energie Steiermark AG

Pirker, F. H.: Analysis and optimization of the make-or-buy decision process of Schelling Anlagenbau GmbH, Project partner: Schelling Anlagenbau GmbH

Schaffer, R. U.: Strategic Analysis of Tool Steel Potential in Emerging Automotive Markets, Project partner: Uddeholms AB

Schatz, P.: Trend Analysis and Establishment of an Industry Roadmap for CNG Systems in the Automotive Industry, Project partner: Magna Steyr AG & Co KG

Straubinger, D.: Energetic analysis and evaluation of potential savings for the bakery Sorger, Project partner: Albin Sorger "zum Weinrebenbäcker" GmbH & Co KG

Tonauer, G.: Process analysis and optimization in the supply chain management of the company S-Tec Service Technologies, Project partner: Service Technologies GmbH & Co OG

Weinig, G. J.: Process analysis and optimization in the laboratory of A. Rieper AG, Project partner: A. Rieper AG

Weiß, P.: Maintenance Cost Comparison of Wheelsets for Metro Bogie Design Concepts, Project partner: Siemens AG

2012 Bäck, S.: Development of standardized product transfer management from Austria to China, Project partner: Andritz AG

Baumann, S. M.: Economic and technological analysis of innovative approaches in gearbox and hybrid calibration, Project partner: AVL List GmbH

Gomboc, T.: Strategic Sourcing in Low-Cost Countries – A Framework for Sourcing in Plant Construction, Project partner: Andritz Energy & Environment GmbH

Hürner, J.: Transparent Quality Performance Monitoring in Batch Production, Project partner: Kendrion Binder Magnete Vertriebs-GmbH

Kleindienst, B.: Outsourcing Body and Trim Engineering Activities – Analysis and Improvement of the Process

Kremshofer, A.: Development of an Innovative Market Approach for AVL Racing, Project partner: AVL List GmbH

Moser, G.: Life Cycle Management in Manufacturing Process Management, Project partner: Université de Technologie Compiègne

Pointner, A.: Pilot Project for the Market Launch of E-Mobility in Austria, Project partner: Porsche Holding GmbH

Radl, J.: Corporate Pricing Strategies in Business to Government Relationships, Project partner: Mercedes-Benz G GmbH

Reitbauer, R.: Quality Function Deployment – Development of ultra high strength thermomechanical rolled seamless steel tubes in crane construction

Schausberger, M.: Development of a catalogue of measurements for the preparation of an optimized flow of work

Schoenberg, K.: Development of a standardized maintenance program for hail suppression systems, Project partner: Südflug GmbH

Steiner, M.: Economic Assessment of Innovative Product Architecture for High Pressure Fuel Storage Systems, Project partner: Magna Steyr AG & Co KG

Stocker, R.: Efficiency enhancement of the production process of forged parts by optimizing the factory layout, Project partner: voestalpine Böhler aerospace GmbH & Co KG

Wunder, S.: Identification of Development Potentials Based on a Benchmarking Study for an Innovation Platform, Project partner: Neurovation GmbH

Zeni, L.: Value analysis of a novel bulk cargo container, Project partner: Innofreight Speditions GmbH

2011 Kleindienst, M.: Design and economic analysis of an innovative maintenance system for rail vehicle bogies, Project partner: Siemens AG

Mitterer, M.J.: Sustainability of Philips' depilation products, Project partner: Philips Austria GmbH

Ottschoffski, T.: Production Planning and Control Systems within Railway Rolling Stock Maintenance

Rabitsch, C.: Analysis and improvement of the order execution process at a medical technology supplier, Project partner: Wild GmbH

Zöhrer, C.: Definition of a multi location tool sourcing process and an organizational implementation concept at HTM High Tech Materials GmbH, Project partner: high-tech-metals Handels- & Fertigungs-GmbH

Bachelor theses

HIGHLIGHTS

▶ Hebenstreit, M (2020): Mixed reality based assembly instruction applied in learning factories

Manufacturing environments face the challenge of ever-increasing complexity in their products due to the continuously increasing degree of individuality. Together with the demand for meeting high quality standards, this leads to the requirement to assist workers during a manufacturing process. Cognitive assistance systems which provide work-related information during their work tasks have been proven to be successful aid for these challenges. Whenever a new emerging technology is applied for worker assistance, the technology should be tested to evaluate its positive or negative impact in a specified assembly process. This work aims to test the impact of an emerging technology, the Microsoft Hololens Head Mounted Display (HMD), in a manufacturing environment. Therefore, a prototypical Mixed Reality (MR) application is introduced which provides assembly-related information to support the worker during his work process and to ensure a zero failure culture. To evaluate the impact of the presented application a comparative study is conducted, comparing existing text-based instructions on touchscreens to the newly-integrated interactive 3D assembly instructions. Although an efficiency cannot be shown in the presented study, a significant increase in quality of the assembled product was gained, leading the way into a zero failure culture.

▶ Auer, F. (2019): Evaluation and visualization of KPIs on digital shop floor management boards

Shop floor management boards are used to visualize different kinds of key performance indicators (KPIs), which are in direct correlation with the recent efficiency and quality of the production process in a company. These boards are used at the LEAD Factory which is an interactive learning environment for students to experience concepts of lean production and other state-of-the-art management systems related to shop floor management. The aim of this thesis is to design dashboards specifically tailored to the factory, which are going to be used for trainings. This is done based on literature review on shop floor management as a whole, the suitable selection of KPIs for shop floor management boards and the visualization of different types of KPIs. In addition to tailoring these boards to the specific needs of the LEAD factory, a data management tool is built to help trainers with the management of the underlying database of the factory. Using this tool, it will be possible to quickly adapt indicators displayed on the dashboards as well as saving and loading data sets representing a specific learning scenario.

Number of Bachelor theses completed

54

Gräfe, M. (2016): Design to value – Integration of customer and company aspects in product development

The increasing globalization, resulting in highly competitive markets, as well as the need to meet the requirements of various stakeholders cause new challenges for companies regarding their product development. In order to enable a competitive advantage, this thesis deals with the design to value approach that aims to maximize the value of products. Based on consumer insights, competitor insights and supplier insights, this approach provides analysis methods to examine these stakeholders. While the conjoint analysis is primarily applied for consumers, the product teardown method is used to analyze solutions for competitors. Finally, the cleansheet target costing includes the components of suppliers. Even though these methods require a lot of resources, they also provide significant value. The design to value process to gene-rate ideas can be divided into the four steps: preparation and customer value analysis, product teardown and design to cost analysis, cleansheet target cost calculation, and finally idea documentation and deep-dive analyses.

Auberger, E. (2015): Makerspaces – Business models and research trends

The maker movement has its origin in the United States of America. In Europe, the trend of establishing makerspaces in various facilities, mostly universities, has spread only recently. In 2014, a FabLab opened at Graz University of Technology and offers everyone the opportunity to realize own ideas by using high-tech equipment. Due to the rising interest of students as well as external people, an enlargement of the spatial capacity and offered workshops is planned for 2016. Besides providing an overview of the origin of the maker movement, this thesis identifies differences between various types of makerspaces as well as analyses their structural design and organization. Furthermore, an important part of this thesis represents the examination of possible business models for future makerspaces. While different alignment options for makerspaces are available, the actual offer of equipment and services needs to be tailored to the particular target group. Finally, existing cooperations for makerspaces with potential stakeholders such as companies or universities were investigated.

ONGOING

Illés, J.: Analysis and reduction of compressed air losses in a plant of the automotive supply industry

Kunst, R.: Workbook für angewandtes Design Thinking – Benchmarking und Ausarbeitung

Reichinger, C.: Simulationsgestützte Optimierung einer Anlage zur Befüllung von Wertschutzschränken

Treul, S.: Barriers to Open Innovation @ Academic Makerspaces

Vela Herero, M.: Material flow analysis and layout design for the production of safes

COMPLETED

2021 Buchrieser, Y.: Developing digital business-models in a well-established company

Gutmann, D.: Manufacturing network planning for the production of agricultural products

Kirschner, C.: Unsicherheiten und Änderungen als Einflussfaktoren auf den Lebenszyklus von Batteriepacks – Eine Literaturperspektive

Landgraf, A.S.: Kompetenzen in der Produktion für KMU Mitarbeiter in der digitalen Transformation

Pomberger, M.: Antriebsbatterien von Elektrofahrzeugen – Anforderungen an die Entwicklung

Rinnhofer, J.: Application setup for the agile operations business game

Rantschl, M.: Feasibility of UWB-based Localization for Industrial Applications

Zwickl, C.: Design for Lifecycle Flexibility – Requirements for a Design Guideline

Holzegger, J.: Elektronische Beschriftungssysteme in Produktionsumgebungen

2020 Fandler, S.: Criteria to assess the flexibility of a battery pack production

Gotthard, M.: Digitalization of the energy-monitoring

Harb, D.: Automatic extraction of process flows and creation of a transport matrix

Hebenstreit, M.: Mixed reality based assembly instruction applied in learning factories

Holzegger, L.: IoT-based monitoring of environmental conditions to improve the production performance

Kainersdorfer, R.: Integration of data analytics platforms in learning factories

Knapp,M.: Produktion in der Montageindustrie in einer volatilen, digitalen Geschäftswelt

Kordasch, G.: Concept study and technical implementation of a modular vending machine

Kordasch, M.: Benchmarking und Konzeptionierung eines Formates zur Nutzung bestehender TU-Patente

Krainer, A.: Simulationsgestützte Produktionsnetzwerkplanung

Kreilinger, L.: Inventarerfassung und –verwaltung für Makerspaces

Lobnig, S.: Physical assistance systems for assembly and logistics

Miskovic, M.: Conducting a comprehensive study on cognitive assistance systems

Ritter, M.: Analyse von Nachhaltigkeitsfaktoren industrieller Logistiksysteme

Valant, B.C.G.: Herausforderungen produzierender KMUs in Zeiten der digitalen Transformation

2019 Auer, F.: Evaluation and visualization of KPIs on digital shop floor management boards

Leski, F.: Efficiency improvement of ideal planning in the factory planning process

Rosenzopf, T.: Management of various resources such as space or machine access, storage facilities and tools in the Laboratory for Innovation

Saiko, M.: Conception of agility levers for Graz University of Technologies LEAD Factory

2018 Casado, E.: Simulation of assembly tasks in the case of TU Graz LEAD Factory

Gotthardt, S.: Machine authorization testing in publicly accessible workshops

2017 Berger, R.: Innovation capability of established companies

Erlacher, G.: Concept Study on Large Volume 3D Printing

Knabe, T.: Development of an Electrification Concept for the IBL Scooter

Lukas, A.: Investigation of Different Research Streams in the R&D/Production Interface

Pirklbauer, C.: FabLabs and 3D Scanners

Rastoder, A.: Potential of Makerspaces for Established Companies

Sadaj, E.: Market Research on Accelerator Programs

Schneebacher, L.: Manifestations of Makerspaces

2016 Bjetak, R.: Complexity Management in Product Development

Gräfe, M.: Design to value – Integration of customer and company aspects in product development

Korajman, I.: Market Study: Maker Movement in Austria

Röhrenbacher, S.: Design of an Open Source Vending Machine

2015 Auberger, E.: Maker Spaces – Business Models and Research Trends

Greimel, K.: Agile Product Development

Kugi, T.: Big Data as a Driver of Agility

Neunteufel, M.: Analysis of the agility of human resources in flexible manufacturing companies

Oswald, S.: Technology Trends in Manufacturing and their Effects on Agility

Pfanzeltner, K.: Manufacturing concepts of the future

Rill, R.: Complexity Challenges – Which challenges do industrial companies have?

Santner, P.: Volatile World – New paradigm or myth in industry?

2014 Heidenbauer, M.: The future of Lean Production

Maringer, G.: Human-machine interaction – Hand in hand with our colleague, the robot

Zettl, S.: Industry 4.0 – Evolution or revolution in manufacturing

2013 Heinzle, P.: Rapid Prototyping Laboratory

CROSS-INDUSTRY CONFERENCE ON AGILE OPERATIONS

More than 100 domain experts and top managers from leading companies made the conference and book presentation a great success.

On the occasion of the publication of the new book "Erfolgsfaktor Agilität: Chancen für Unternehmen in einem volatilen Umfeld", the Institute of Innovation and Industrial Management and McKinsey & Company invited scholars and practitioners to join the "Cross-Industry Conference on Agile Operations" in the Aula of Graz University of Technology on February 3, 2017. In addition to keynote speeches by renowned industry representatives, interested participants also had the opportunity to deepen their knowledge on the topic of agility in practice-oriented workshops.

More volatile markets and the increasing uncertainty regarding economic and technological developments pose new challenges to companies worldwide. To enable fast and efficient adaptation to continuously changing competitive conditions, companies have to become more agile. The goal is to systematically prepare for potential uncertainties and to simulate their impact on the operations using concrete scenarios.

The Institute for Innovation and Industrial Management, together with McKinsey & Company, has devoted several years to extensive research about the agility of industrial companies and the results of this cooperation were presented at the conference. More than 100 international participants from various industries and countries accepted the invitation and made the conference a complete success. Both industry representatives and researchers agreed: In addition to the topic of digitalization, agility has become a critical success factor and rightly enjoys the highest priority on today's top management agendas.

> "For us, it is extremely important to increase our competitiveness in the future – to operate profitably in a growing market, but also in a flattening market. We are pleased to have an institute here at TU Graz that will take care of this issue in the future."

explained Karl-Friedrich Stracke (President, Magna Steyr), who addressed the special challenges in the automotive industry in his presentation. In addition to Magna Steyr, representatives from Daimler, Lufthansa, Zalando and McKinsey talked about what agility means for their companies in daily business and why it is important to devote attention to the topic today particularly.

Another highlight was the book presentation by two of the editors. Prof. Christian Ramsauer and Dr. Christoph Schmitz (Senior Partner, McKinsey & Company) explained the central building blocks of an agile enterprise system and outlined the financial benefits of agility with results of quantitative studies.

The subsequent afternoon program offered interested parties the opportunity to participate in workshops held in small groups by external experts and IIM staff. The participants were able to deepen their knowledge of important aspects of agility and received state-of-the-art insights as well as tips for concrete implementation possibilities in industrial practice. ▸

“The authors present a publication that has the potential to become the new standard reference.”

HARVARD BUSINESS MANAGER, 05/2017

Agility book team:

Dr. Stefan Heldmann
Dr. Matthias Schurig
Dr. Martin Kremsmayr
Dr. Andreas Hönl
Dr. Christoph Schmitz
Dominik Luczak
Prof. Christian Ramsauer
Marco Wampula
Dr. Alexander Pointner
Dr. Christian Rabitsch

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“Agility is an essential element of any digital transformation and thus a very important topic on the top management agenda.”

Claudia Nemat
(Board Member,
Deutsche Telekom AG)

AT&S

“In the complex and dynamic market environment of the electronics industry, the rapid strategic and operational reaction to market changes detected at an early stage is critical to success. This book provides a possible systematic approach.”

Andreas Gerstenmayer
(CEO, AT&S Austria Technologie
& Systemtechnik AG)

Jörg Hennemann
(SVP Commercial Fleet
Management, Lufthansa)

Karl-Friedrich Stracke
(President, Magna Steyr)

Dr. Christoph Lütke Schelhowe
(VP Product Analytics, Zalando)

Dr. Florian Weig
(Senior Partner,
McKinsey & Company)

"Agility – Speed and simplicity is a guiding principle during the integration of two industry champions after the TRW takeover by ZF. The book is dedicated to this current and is very important for managers. It is definitely worth reading."

Dr. Holger Klein
(Member of the Board
of Management, ZF Group)

"Agility enables companies to react to uncertainties and to operate a profitable business in the long term. We at Magna Steyr are proud of the fact that, together with the authors, we showed impressive examples for concrete implementations of agility in industrial practice."

Günther Apfalter
(President Magna Europe)

RESEARCH CONTRIBUTIONS 2/2

Books

2017 Ramsauer, C.; Kayser, D.; Schmitz, C. (ed.): Erfolgsfaktor Agilität – Chancen für Unternehmen in einem volatilen Marktumfeld, Wiley-VCH Verlag, Weinheim 2017

2013 Ramsauer, C. (ed.): Industrial Engineering und Innovation, Verlag der Technischen Universität Graz, Graz 2013

Book contributions

2017 Heldmann, S.: Informiert – Monitoring als Schnittstelle zum unsicheren Geschäftsumfeld, in: Ramsauer, C.; Kayser, D.; Schmitz, C. (ed.): Erfolgsfaktor Agilität – Chancen für Unternehmen in einem volatilen Marktumfeld, Wiley-VCH Verlag, Weinheim 2017, pp. 127-160

Kremsmayr, M.: Unsicher – Auswirkungen einer veränderten Welt, in: Ramsauer, C.; Kayser, D.; Schmitz, C. (ed.): Erfolgsfaktor Agilität – Chancen für Unternehmen in einem volatilen Marktumfeld, Wiley-VCH Verlag, Weinheim 2017, pp. 43-61

Pointner, A.: Vorbereitet – Anwendung der Agilitätsstellhebel, in: Ramsauer, C.; Kayser, D.; Schmitz, C. (ed.): Erfolgsfaktor Agilität – Chancen für Unternehmen in einem volatilen Marktumfeld, Wiley-VCH Verlag, Weinheim 2017, pp. 64-81

Rabitsch, C.: Strategisch – Das richtige Maß an Agilität, in: Ramsauer, C.; Kayser, D.; Schmitz, C. (ed.): Erfolgsfaktor Agilität – Chancen für Unternehmen in einem volatilen Marktumfeld, Wiley-VCH Verlag, Weinheim 2017, pp. 81-95

Schurig, M.: Definiert – Was man unter Agilität versteht, in: Ramsauer, C.; Kayser, D.; Schmitz, C. (ed.): Erfolgsfaktor Agilität – Chancen für Unternehmen in einem volatilen Marktumfeld, Wiley-VCH Verlag, Weinheim 2017, pp. 9-27

Conference contributions

2016 Ramsauer, C.; Friessnig, M.: Einfluss der Maker Movement auf die Forschung und Entwicklung, in: Biedermann, H. (ed.): Industrial Engineering und Management: Beiträge des Techno-Ökonomie Forums der TU Austria, Springer Fachmedien Wiesbaden, Wiesbaden 2016, pp. 177-188

Ramsauer, C.; Rabitsch, C.: Agile Produktion – Ein Produktionskonzept für gesteigerten Unternehmenserfolg in volatilen Zeiten, in: Biedermann, H. (ed.): Industrial Engineering und Management: Beiträge des Techno-Ökonomie Forums der TU Austria, Springer Fachmedien Wiesbaden, Wiesbaden 2016, pp. 85-97

2013 Danzer, H.H.: Advanced Product Quality Planning, in: Kamiske, G.F. (ed.): Handbuch QM-Methoden, Verlag der Technischen Universität Graz, Graz 2013, pp. 98-112

Danzer, H.H.: Ist Qualität heute noch gut genug?, in: Ramsauer, C. (ed.): Industrial Engineering und Innovation, Verlag der Technischen Universität Graz, Graz 2013, pp. 113-125

Ramsauer, C.: ÖVIA Praxiswissen Instandhaltung, in: Biedermann, H. (ed.): Ressourceneffizientes Anlagenmanagement, TÜV Media, Köln 2013, pp. 126-138

Spitzer, J.: Die Energiewende – Herausforderung für Technik, Wirtschaft und Politik, in: Ramsauer, C. (ed.): Industrial Engineering und Innovation, Verlag der Technischen Universität Graz, Graz 2013, pp. 139-151

2021 Hulla, M.; Herstätter, P.; Wolf, M.; Ramsauer, C.: Towards digitalization in production in SMEs – A qualitative study of challenges, competencies and requirements for trainings, 54th CIRP Conference on Manufacturing Systems, Athen (GRC), 22.-24.09.2021

Auberger, E.; Karrer, H.; Wolf, M.; Preising, H.; Ramsauer, C.: Configuration and coordination of manufacturing networks by a multi-objective perspective enabled by simulation and advanced data analytics, 54th CIRP Conference on Manufacturing Systems, Athen (GRC), 22.-24.09.2021

Herstätter, P.; Kohlweiss, A.; Hulla, M.; Ramsauer, C.: Transferring an interdisciplinary student product development project to full online conduction, 12th International Scientific Conference: Management of Technology Step to Sustainable Production, Porec (CRO), 08.-10.09.2021

Hulla, M.; Herstätter, P.; Moser, D.; Burgsteiner, H.; Ramsauer, C.: Competency Models for the Digital Transformation and Digitalization in European SMEs and Implications for Vocational Trainings in Learning Factories and Makerspaces, European Conference on Educational Research (ECER 2021), Geneva (CHE), 06.-10.09.2021

Ketenci, A.; Eder, M.; Ritter, M.; Ramsauer, C.: Scenario-based Simulation for Energy Optimization in Learning Factory Environments, in: Proceedings of CLF 2021, 11th Conference on Learning Factories, Graz (AUT), 01.-02.07.2021

Eder, M.; Hulla, M.; Auer, F.; Ramsauer, C.: Interactive Teaching Concept for a Data Analytics Workshop in Learning Factories, in: Proceedings of CLF 2021, 11th Conference on Learning Factories, Graz (AUT), 01.-02.07.2021

Eder, M.; Spitzer, M.; Hebenstreit, M.; Ramsauer, C.: Development and Evaluation of a Mixed Reality Assistance System in the Context of Manual Assembly, in: Proceedings of CLF 2021, 11th Conference on Learning Factories, Graz (AUT), 01.-02.07.2021

Sadaj, E.; Hulla, M.; Herstätter, P.; Ramsauer, C.: Corporate Learning Factories – Benefits, Challenges, and Success Factors of Learning Factories in Industry, in: Proceedings of CLF 2021, 11th Conference on Learning Factories, Graz (AUT), 01.-02.07.2021

Kohlweiss, A.; Schnöll. H. P.; Herstätter, P.; Ramsauer, C.: Reduction of Innovation Barriers across Maker, Industry & Research @ Academic Makerspaces, in: OUI 2021: Book of Abstracts, 18th Open and User Innovation Conference, Aachen (GER), 21.-22.06.2021

Wolf, M.; Siedl, S.: Aging Workers in Industry and Retail Sector – A Holistic Approach for an Age-Related Evaluation and Design of Work, in Proceedings of the IEA 2021 – Volume II: Inclusive Design, 21st Congress of the International Ergonomics Association, 13.-18.06.2021, pp. 50-60

Röhrenbacher, S.; Moerth-Teo, O.; Schwarz, L.; Schnöll, H. P.; Ramsauer, C.: Product Cost Estimation in the early Development Phases – The Case of Powertrain Systems and Battery Packs, 1st Resource Efficient Vehicles Conference (rev2021), Stockholm (SWE), 14.-16.06.2021

2020 Moerth-Teo, O.; Schwarz, L.; Ramsauer, C.: Design for Lifecycle-Flexibility – Design objectives that enhance coping with uncertainties throughout product lifecycles, 9th International Conference on Through-life Engineering Services (TESConf 2020), Cranfield (UK), 03.-04.11.2020

Hebenstreit, M.; Spitzer, M.; Eder, M.; Ramsauer, C.: An Industry 4.0 Production Workplace Enhanced by Using Mixed Reality Assembly Instructions with Microsoft HoloLens, Mensch und Computer 2020 (MuC 2020), Magdeburg (GER), 06.-09.09.2020

Hulla, M., Herstätter P., Moser D., Burgsteiner H., Ramsauer C.: Konzeption eines Trainings in einer Lernfabrikumgebung für KMUs in einer digitalen, volatilen Geschäftswelt, Poster, Skills4-Future, Graz (AUT), 17.-18.09.2020

Sadaj, E.; Hulla, M.; Ramsauer C.: Design approach for a learning factory to train services, in: Procedia Manufacturing, 10th Conference on Learning Factories 2020, Graz (AUT), 16.-17.04.2020, pp. 60-65

Eder, M.; Hulla M.; Mast F.; Ramsauer C.: On the application of Augmented Reality in a learning factory working environment, in: Procedia Manufacturing, 10th Conference on Learning Factories 2020, Graz (AUT), 16.-17.04.2020, pp. 7-12

Eder, M.; Ketenci A.; Auberger E.; Gotthard M.; Ramsauer C.: Integration of low-cost digital energy meters in learning factory assembly lines, in: Procedia Manufacturing, 10th Conference on Learning Factories 2020, Graz (AUT), 16.-17.04.2020, pp. 202-207

Moerth-Teo O.; Eder M.; Holzegger L.; Ramsauer C.: IoT-based monitoring of environmental conditions to improve the production performance, in: Procedia Manufacturing, 10th Conference on Learning Factories 2020, Graz (AUT), 16.-17.04.2020, pp. 283-288

Kohlweiss, A.; Auberger, E.; Ketenci, A.; Ramsauer, C.: Integration of a teardown approach at Graz University of Technology's LEAD Factory, in: Procedia Manufacturing, 10th Conference on Learning Factories 2020, Graz (AUT), 16.-17.04.2020, pp. 240-245

Herstätter, P., Wildbolz, T., Hulla, M., Ramsauer, C.: Data acquisition to enable research, education and training in learning factories and makerspaces, in: Procedia Manufacturing, 10th Conference on Learning Factories 2020, Graz (AUT), 16.-17.04.2020, pp. 289-294

2019 Moerth-Teo O.; Emmanouilidis, C.; Hafner, N.; Schadler, M.: Implementation of Cyber-Physical systems in intralogistics – IoT in conveyor technology, Poster, in: Solution day – „update" Logistikwerkstatt Graz 2019, Graz (AUT), 22.05.2019, pp. 207-211

Eder, M.; Hulla, M.; Gotthardt, S.; Karre, H.; Ramsauer, C.: Digitalization of a Milk-Run, Poster, in: Solution day – „update" Logistikwerkstatt Graz 2019, Graz (AUT), 22.05.2019, pp. 193-200

Wolf, M.; Herstätter, P.; Ramsauer, C.: Using the IIM LEAD factory to identify countermeasures for the demographic challenge, in: Procedia Manufacturing Volume 31: Research. Experience. Education, 9th Conference on Learning Factories 2019 (CLF 2019), Braunschweig (GER), 26.-28.03.2019, pp. 123-128

Gotthardt, S.; Hulla, M.; Eder, M.; Karre, H.; Ramsauer, C.: Digitalized milk-run system for a learning factory assembly line, in: Procedia Manufacturing Volume 31: Research. Experience. Education, 9th Conference on Learning Factories 2019 (CLF 2019), Braunschweig (GER), 26.-28.03.2019, pp. 175-179

Karre, H.; Hammer, M.; Ramsauer, C.: Building capabilities for agility in a learning factory setting, in: Procedia Manufacturing Volume 31: Research. Experience. Education, 9th Conference on Learning Factories 2019 (CLF 2019), Braunschweig (GER), 26.-28.03.2019, pp. 175-179

Hulla, M.; Hammer, M.; Karre, H.; Ramsauer, C.: A Case Study based Digitalization Training for Learning Factories, in: Procedia Manufacturing Volume 31: Research. Experience. Education, 9th Conference on Learning Factories 2019 (CLF 2019), Braunschweig (GER), 26.-28.03.2019, pp. 169-174

Eder, M.; Reip, M.; Steinbauer, G.: Using Particle Filter and Machine Learning for Accuracy Estimation of Robot Localization, in: Advances and Trends in Artificial Intelligence. From Theory to Practice, 32nd International Conference on Industrial, Engineering & Other Applications of Applied Intelligent Systems, Graz (AUT), 09.-11.07.2019, pp. 700-713

Auberger, E.; Karre, H.; Ramsauer C.: Introduction of a new product in an operating assembly process at Graz University of Technology´s LEAD Factory, in: Procedia Manufacturing Volume 31: Advanced Engineering Education & Training for Manufacturing Innovation, 9th Conference on Learning Factories (CLF 2019), Braunschweig (GER), 26.-28.03.2019, pp. 103-108

Kreilinger, L.; Ramsauer, C.: PHABLABS 4.0 – Motivating young students to choose a STEM career via hands-on workshop experiences, Poster, International Symposium on Academic Makerspaces 2019 (ISAM 2019), Yale University, New Haven (USA), 16.-18.10.2019

Schnöll, H. P.; Ramsauer, C.: Schumpeter Lab for Innovation, Video, International Symposium on Academic Makerspaces 2019 (ISAM 2019), Yale University, New Haven (USA), 16.-18.10.2019

Wildbolz, T.; Schnöll, H. P.; Ramsauer, C.: Managing access to space, tools, and machines at the Schumpeter Laboratory for Innovation, in: Proceedings of the 4th International Symposium on Academic Makerspaces (ISAM 2019), Yale University, New Haven (USA), 16.-18.10.2019

Herstätter, P.; Schnöll, H.P.; Ramsauer, C.: Product Innovation Project: Experiences and learnings from 13 years of making at academic makerspaces, in: Proceedings of the 4th International Symposium on Academic Makerspaces (ISAM 2019), Yale University, New Haven (USA), 16.-18.10.2019

Kohlweiss, A.; Schnöll H.P.; Ramsauer C.: Barriers and Need for action to enforce Cooperation of Maker, Industry and Research @ Academic Makerspaces, in: Proceedings of the 4th International Symposium on Academic Makerspaces (ISAM 2019), Yale University, New Haven (USA), 16.-18.10.2019

2018 Friessnig, M.; Handy, L.; Ramsauer, C.: The Role of Makerspaces in Product Development of Hardware Start-Ups, Poster No. 17, ISAM 2018, Stanford (US), 03.-05.08.2018

Hulla, M., Karre H., Hammer M. (et al.): A Teaching Concept Towards Digitalization at the LEAD Factory of Graz University of Technology, in: Advances in Intelligent Systems and Computing of the 21st Conference on Interactive Collaborative Learning, ICL 2018, Kos (GR), 25.-28.09.2018, in Press

Hulla, M.; Karre, H.; Hammer, M.; Ramsauer, C.: A Teaching Concept Towards Digitalization at the LEAD Factory of Graz University of Technology, in: Proceedings of the 21st International Conference on Interactive Collaborative Learning ICL2018 – Volume 2: The Challenges of the Digital Transformation in Education, Kos (GRE), 25.-28.09.2018, pp. 393-402

Schnöll, H.P.; Wildbolz, T.; Ramsauer, C.: Enforcing Innovation across Maker, Industry and Research, Using Capabilities of Academic Makerspaces, Poster No. 11, ISAM 2018, Stanford (US), 03.-05.08.2018

Wolf, M., Ramsauer C.: Towards an Age-Differentiated Assessment of Physical Work Strain, in: Proceedings of the 20th Congress of the International Ergonomics Association, IEA 2018, Florence (IT), 20.-30.08.2018, pp. 189-205

Karre, H.; Hammer, M.; Ramsauer C.: Learn how to cope with volatility in operations at Graz University of Technology's LEAD Factory, in: Procedia Manufacturing: Advanced Engineering Education & Training for Manufacturing Innovation 8th CIRP Sponsored Conference on Learning Factories, Patras (GR), 12.-13.04.2018, pp. 15-20

2017 Armengaud, E.; Sams, C.; von Falck, G. (et al.): Industry 4.0 as Digitalization over the Entire Product Lifecycle: Opportunities in the Automotive Domain, in: Systems, Software and Services Process Improvement, EuroSPI 2017, Ostrava (CZE), 06.-08.09.2017, pp. 334-351

Friessnig, M.; Böhm, T.; Ramsauer, C.: The role of Academic Makerspaces in product creation: Matching between hardware entrepreneur's requests and Maker Movement elements on offer, International Symposium on Academic Makerspaces 2017, Cleveland (US), 24.-27.09.2017

Hammer, M.; Karre, H.; Ramsauer, C.: Resource-Productive Operations – How Lean, Green and Constraint Management Blend Together, MOTSP 2017 (International Conference Management of Technology – Step to Sustainable Production), Dubrovnik (HRV), 04.-07.04.2017

Hammer, M.; Somers, K.; Karre, H. (et al.): Profit Per Hour as a Target Process Control Parameter for Manufacturing Systems Enabled by Big Data Analytics and Industry 4.0 Infrastructure, in: Procedia CIRP: Manufacturing Systems 4.0 – Proceedings of the 50th CIRP Conference on Manufacturing Systems, Taichung City (TWN), 03.-05.05.2017, pp. 715-720

Karre, H.; Hammer, M.; Kleindienst, M. (et al.): Transition towards an Industry 4.0 state of the LeanLab at Graz University of Technology, in: Pocedia Manufacturing – Proceedings of the 7th CIRP Conference on Learning Factories, Darmstadt (GER), 04.-05.04.2017, pp. 206-213

Ramsauer, C.; Heldmann, S.; Heise, M.; Winkler, R.: Bedeuten mehr Daten auch bessere Entscheidungen? – in: bitkom Big Data Summit 2017, Hanau (GER), 16.02.2017

Sams, C.; von Falck, G.: Mastering of powertrain complexity in early development phase, in: Smart Automotive Variant CON, Berlin (GER), 29.11.2017

Wolf, M.; Kleindienst, M.; Ramsauer, C. (et al.): Current and Future Industrial Challenges: Demographic Change and Measures for Elderly Workers in Industry 4.0, in: MOTSP 2017 (International Conference Management of Technology – Step to Sustainable Production), Dubrovnik (HRV), 04.-07.04.2017

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Kleindienst, M.: Experience and Experiment – The IBL LeanLab, Introduction Day at TU Graz, Graz University of Technology, Graz (AUT), 11.03.2015

Kleindienst, M.: Experience and Experiment – The IBL LeanLab, Introduction Day at TU Graz, Graz University of Technology, Graz (AUT), 15.01.2015

Kleindienst, M.: Lean Training for Alpen-Maykestag GmbH, Executive Education, Graz University of Technology, Graz (AUT), 06.02.2015

Kleindienst, M.: Lean Training for GAW technologies GmbH, Executive Education, Graz University of Technology, Graz (AUT), 16.04.2015

Kleindienst, M.: Project Smart Factory, Industry 4.0 Workshop, Graz (AUT), 15.10.2015

Kleindienst, M.: Teambuilding for FTÖ – Internes Teambuilding des Fachbereichs Techno-Ökonomie der TU Graz, Graz University of Technology, Graz (AUT), 09.07.2015

Pointner, A.: Agility Levers for Manufacturing, TU Graz / McKinsey Workshop, Graz University of Technology, Graz (AUT), 24.04.2015

Pointner, A.: Anlaufmanagement bei kundenspezifischer Auftragsfertigung, Plansee Group, Reutte (AUT), 26.02.2015

Pointner, A.: Innovation at FabLab Graz, Forum Alpbach, Alpbach (AUT), 20.08.2015

Pointner, A.: Innovation at TU Graz: 3D Glider for national parks, Forum Alpbach, Alpbach (AUT), 20.08.2015

Pointner, A.: Innovation Management, Product Design Gala, Aalto Design Factory & Urban Mill, Helsinki (FIN), 21.05.2015

Pointner, A.: Product Innovation, Graz University of Technology, Graz (AUT), 02.06.2015

Pointner, A.: The Future of Manufacturing Know-How, FSI Annual Project Meeting, Frank Stronach Institute, Graz University of Technology, Graz (AUT), 22.10.2015

Rabitsch, C.: Agile Manufacturing – Adapting Operations to Succeed in Volatile Times, FSI Annual Project Meeting, Frank Stronach Institute, Graz University of Technology, Graz (AUT), 22.10.2015

Rabitsch, C.: Management Approach for Implementing Agility in Manufacturing Industry, 17. Techno-Ökonomie Kolloquium, Graz University of Technology, Graz (AUT), 15.04.2015

Ramsauer, C.: Neue Wege der Mobilität und die Herausforderungen zukünftiger Produktion, Industriedialog Forschung, Graz University of Technology, Graz (AUT), 20.10.2015

Ramsauer, C.: The Evolution of Digital Manufacturing and Implications on Metals Production, Dresden (GER), 03.12.2015

2014 Böhm, T.: Sparkling Scooter, Open House Day, BG/BRG Carneri, Graz (AUT), 28.11.2014

Friessnig, M.: FabLab – A Movement in the Making, FSI Annual Project Meeting, Frank Stronach Institute, Graz University of Technology, Graz (AUT), 28.10.2014

Friessnig, M.: FabLab@School, AK Technology Enhanced Learning, Graz University of Technology, Graz (AUT), 16.12.2014

Friessnig, M.; Oswald, P.: Production Technology Requirements with Respect to Agile Manufacturing, FSI Annual Project Meeting, Frank Stronach Institute, Graz University of Technology, Graz (AUT), 28.10.2014

Friessnig, M.; Stock, M.: World Class Logistics in Operations, FSI Annual Project Meeting, Frank Stronach Institute, Graz University of Technology, Graz (AUT), 28.10.2014

Kleindienst, M.: Additive Manufacturing in Small Series Production – Applications and Restrictions of a New Technology, FSI Annual Project Meeting, Frank Stronach Institute, Graz University of Technology, Graz (AUT), 28.10.2014

Kleindienst, M.: Die IBL Lernfabrik: Effizienz – Die Grundlage der Produktion in Europa?, Lange Nacht der Forschung, Graz University of Technology, Graz (AUT), 04.04.2014

Kleindienst, M.: Experience and Experiment – The IBL LeanLab, Introduction Day at TU Graz, Graz University of Technology, Graz (AUT), 10.07.2014

Kleindienst, M.: IBL Lernfabrik – Vorstellung des Konzepts, Lange Nacht der Forschung, Graz University of Technology, Graz (AUT), 04.04.2014

Kleindienst, M.: Lean Training for Rail Cargo Austria, Executive Education, Graz University of Technology, Graz (AUT), 26.11.2014

Kleindienst, M.: LeanLab – A modern training ground for targeted executive education, FSI Annual Project Meeting, Frank Stronach Institute, Graz University of Technology, Graz (AUT), 28.10.2014

Kleindienst, M.: Lernfabrik am IBL Institut der TU Graz, Ideen-Workshop RFID-Qualifizierungsnetzwerk, Graz University of Technology, Graz (AUT), 10.01.2014

Kleindienst, M.; Brillinger, M.: Additive Manufacturing in Small Series Production – Technologies, Constraints and Opportunities of 3D Printing in Industrial Companies, FSI Annual Project Meeting, Frank Stronach Institute, Graz University of Technology, Graz (AUT), 28.10.2014

Kleindienst, M.; Zeininger, H.: Assistance Systems in Manufacturing – Another Step towards Industry 4.0, FSI Annual Project Meeting, Frank Stronach Institute, Graz University of Technology, Graz (AUT), 28.10.2014

Pointner, A.: Agile Produktion, Projekt Agile Produktion, Munich (GER), 10.02.2014

Pointner, A.: Agilität in der Produktion, Agility Off-Site Seminar, Kitzbühl (AUT), 28.11.2014

Pointner, A.: Agilität in der Produktion, Infineon Technologies GmbH, Neubiberg (GER), 27.11.2014

Pointner, A.: Anlaufmanagement in der Automobilindustrie, BMW Motoren GmbH Steyr, Steyr (AUT), 20.11.2014

Pointner, A.: Creativity Techniques, Monthly Meetings of the Product Development Project, Aalto University Helsinki, Helsinki (FIN), 06.10.2014

Pointner, A.: Industrie 4.0 – Produktion der Zukunft?, Forum Stanztechnik, Bochum (GER), 11.11.2014

Pointner, A.: Industrie 4.0 – The Future of Production, FSI Annual Project Meeting, Frank Stronach Institute, Graz University of Technology, Graz (AUT), 28.10.2014

Pointner, A.: Product Innovation Management, Research & Technology House, Graz University of Technology, Graz (AUT), 05.02.2014

Pointner, A.: Product Innovation – Development of Working Prototypes, FSI Annual Project Meeting, Frank Stronach Institute, Graz University of Technology, Graz (AUT), 28.10.2014

Pointner, A.: Ramp-Up Management in Automotive Industry – Time-to-Market Oriented, FSI Annual Project Meeting, Frank Stronach Institute, Graz University of Technology, Graz (AUT), 28.10.2014

Pointner, A.: Umsetzung und Erfahrung der Product Innovation Project, Infoveranstaltung zum Thema Produktinnovation, University of Applied Sciences, Graz (AUT), 15.10.2014

Pointner, A.: Vorserienzentrum als Bestandteil des Anlaufmanagements, MAN Truck & Bus AG, Steyr (AUT), 09.04.2014

Pointner, A.: Zweitanläufe bei Automobilzulieferern, RWTH Aachen University, Aachen (GER), 13.11.2014

Rabitsch, C.: Agile Manufacturing – A Model for Business Operations in Volatile Times, FSI Annual Project Meeting, Frank Stronach Institute, Graz University of Technology, Graz (AUT), 28.10.2014

Rabitsch, C.: Agile Manufacturing – Business Operations in Volatile Times, Agility Off-Site Seminar, Kitzbühl (AUT), 28.11.2014

Rabitsch, C.: Agility Research at Graz University of Technology, Robust and Agile Supply Chain Workshop, Munich (GER), 27.11.2014

Ramsauer, C.: Agile and robust Supply Chain, Forum Alpbach, Alpbach (AUT), 20.08.2014

Ramsauer, C.: Agile Manufacturing, FSI Annual Project Meeting, Frank Stronach Institute, Graz University of Technology, Graz (AUT), 28.10.2014

Ramsauer, C.: Erfolgsfaktoren für Kooperationen mit US-amerikanischen Universitäten, Kaminabend des Industrieforum F&E, Graz University of Technology, Graz (AUT), 23.10.2014

Ramsauer, C.: FabLab, WKO Unternehmertag 2014, Business Fair Graz, Graz (AUT), 14.10.2014

Ramsauer, C.: Industrie 4.0, Panel Discussion Industrie 4.0 made in Styria, AT&S Austria AG, Leoben (AUT), 30.10.2014

Ramsauer, C.: Industrie 4.0 – die vierte industrielle Revolution, Oberösterreichische Zukunftsakademie – Industrie 4.0 – eine Mensch-Technik-Kooperation, Schlossmuseum Linz, Linz (AUT), 05.06.2014

Ramsauer, C.: Industrie 4.0 – Welche Trends sind absehbar?, 11. Steirischer BVL-Logistik Tag und Automotive Day, Graz Airport, Graz (AUT), 08.05.2014

Ramsauer, C.: Initiativen für Studenten der TU Austria, TU Austria Dezemberklausur 2014, Montanuniversität Leoben, Leoben (AUT), 22.12.2014

Ramsauer, C.: Innovation that is the Process of Finding Economic Applications for Inventions, Graz University of Technology, Graz (AUT), 02.06.2014

Ramsauer, C.: Panel Discussion – Von Graz aus die Welt erobern? – ein Erfahrungsaustausch unter weitgereisten Unternehmern, GründerInnenabend Science Park, Graz University of Technology, Graz (AUT), 11.06.2014

Schurig, M.: Einfluss der Agilität von Produktionsunternehmen auf deren Supply Chain, 15. Techno-Ökonomie Kolloquium, Vienna University of Technology, Vienna (AUT), 19.03.2014

2013 Böhm, T.: Die Lernfabrik am Institut für Industriebetriebslehre und Innovationsforschung, Ideen-Workshop des Humantechnologie-Clusters, Graz (AUT), 19.11.2013

Kleindienst, M.: Die Lernfabrik – Hands-on Training in der Fabrik im Hörsaal, Forum Techno-Ökonomie, Graz University of Technology, Graz (AUT), 05.05.2013

Kleindienst, M.: Konzept zur Lernfabrik am Institut für Industriebetriebslehre und Innovationsforschung, Kooperationspotentiale zwischen IBL-Institut und Industriellenvereinigung, Graz (AUT), 30.09.2013

Kleindienst, M.: Manufacturing-Process Innovation at Small- and Medium-Sized Enterprises, 14. Techno-Ökonomie Kolloquium, Graz University of Technology, Graz (AUT), 05.11.2013

Pointner, A.: Anlaufmanagement in der Produktion, Weiterbildungsseminar Alstom AG, Baden (AUT), 24.09.2013

Pointner, A.: E-Mobility as System Innovation – Opportunity for different industries? Forum Techno-Ökonomie, Graz University of Technology, Graz (AUT), 05.05.2013

Pointner, A.: Production Science and Management, Introduction of the FSI, Frank Stronach Institute, Graz University of Technology, Graz (AUT), 13.03.2013

Ramsauer, C.: Agile Produktion, RWTH Aachen University, Aachen (GER), 29.11.2013

Ramsauer, C.: Die Zukunft der Produktion, Innovationskongress Villach, Villach (AUT), 15.11.2013

Ramsauer, C.: Die Zukunft der Produktion in Hochlohnländern, Rotary Club Graz Neutor, Graz (AUT), 15.11.2013

Ramsauer, C.: Industrie 4.0 – Produktion der Zukunft, Industrie 4. 0 – Eine Vision auf dem Weg zur Wirklichkeit, Graz (AUT), 20.11.2013

Ramsauer, C.: Masterprogramm Production Science and Management, PSM Student Day, Graz University of Technology, Graz (AUT), 06.06.2013

Ramsauer, C.: Neuausrichtung des Fachbereichs für Wirtschafts- und Betriebswissenschaften, WING-Regionalkreisveranstaltung Steiermark, Graz (AUT), 04.04.2013

Ramsauer, C.: Product Innovation, Graz University of Technology, Graz (AUT), 13.05.2013

Ramsauer, C.: Ressourceneffizienz – Ein Wettbewerbsfaktor für Produktionsunternehmen, ÖVIA Kongress 2013: Ressourceneffizientes Anlagenmanagement, Hotel Panhans, Semmering (AUT), 01.10.2013

Schnöll, H. P.: Das “Product Innovation”, Nachhaltige Entwicklungen an der TU Graz und ihre Initiatoren: Innovation und Tradition – Josef Wohinz, Graz University of Technology, Graz (AUT), 06.06.2013

Schnöll, H. P.: Outlook: The future of Product Innovation, Graz University of Technology, Graz (AUT), 13.05.2013

Schnöll, H. P.; Stocker, R.: Materialflussanalyse und Layoutplanung – Effizienzsteigerung der Produktionsprozesse von Schmiedeteilen durch Optimierung des Fabriklayouts, Logistikwerkstatt Graz – Solution Day, Graz University of Technology, Graz (AUT), 24.05.2013

Unzeitig, W.: Szenarienbasierte Fabriksplanung, Forum Techno-Ökonomie, Graz University of Technology, Graz (AUT), 5.5.2013

2012 Ramsauer, C.: Product Innovation Project, Graz University of Technology, Graz (AUT), 14.05.2012

Ramsauer, C.: Produktionsstrategie – Aktuelle Herausforderungen und Fragen bei Betriebsansiedlungen im industriellen Umfeld, Steirische Wirtschaftsförderungs GmbH, Graz (AUT), 21.03.2012

2011 Schnöll, H. P.: Zur Integration der Prozess- und Produktinnovation im Bereich der Faserkunststoffverbundwerkstoffe für die Fahrzeugindustrie, 10. Techno-Ökonomie Kolloquium, Graz University of Technology, Graz (AUT), 29.11.2011

LOOKING BACK AT 50 YEARS OF HISTORY

Innovation and industrial Management have been the focus of the institute for over 50 years. 5 professors, 79 scientific assistants and 8 administrative assistants have shaped the identity of the institute.

1970

Founding of the Institute of Industrial Management and Business Technology (Institut für Industriebetriebslehre und Wirtschaftstechnik); Prof. Hans Hinterhuber becomes the first head of the Institute.

1970-2021

1970	1971	1972	1973

PROFESSORS

PROF. HANS HINTERHUBER

ADMINISTRATIVE ASSISTANTS

1970-2000	ANNELIESE KRENN
1970-1975	HEIDRUN ZANKL

Scientific Assistants

▲ Werner Leuker

▲ Bert Köfer

▲ Gerhard Egger

▲ University Assistant ▲ Project Assistant ▲ Scientific Assistant without Doctorate

1975

Prof. Walter Veit becomes curator of the Institute.

9 July 1980:
IBL – BWL Tennis Tournament

Prof. Josef Wohinz and Prof. Walter Veit

8 February 1980:
Skiing at Salzstiegl

f.l.t.r.:
Dr. Reinhard Busch
Gerhard Dolejschi
Dr. Norbert Obermayer
Dr. Edmund Fabi
Prof. Josef Wohinz
Anneliese Krenn
Dr. Michael Moor

1979

Prof. Josef Wohinz becomes head of the institute; Renaming to Institute of Industrial Management and Innovation Research (Institut für Industrie-betriebslehre und Innovationsforschung).

Video:
History of the Institute - Interview of Prof. Christian Ramsauer with Prof. Josef Wohinz

25-27 June 1987:
Morning run at the workshop at Judenburger Hütte

1979	1980	1981	1982	1983	1984

PROF. JOSEF WOHINZ

1970-2000	ANNELIESE KRENN
1976-1995	DOROTHEA KAPONAKIS

▲ Günther Burtscher

▲ Dr. Edmund Fabi

▲ Dr. Reinhard Busch

▲ Dr. Wilhelm Glaser

▲ University Assistant ▲ Project Assistant ▲ Scientific Assistant without Doctorate

f.l.t.r.:
Dr. Michael Moor
Prof. Josef Wohinz
Dr. Rupert Hasenöhrl
Dr. Ulrike Gaida
Dr. Roland Falb
Anneliese Krenn
Dr. Thomas Stüger
Dorothea Kaponakis
Dr. Alexander Wiegele
Brigitte Obermayr
Dr. Norbert Obermayr
Dr. Uwe Pölzl

20 October 1986:
Field trip to Attnang-Puchheim

October 1989:
Boat trip

At the steering wheel
Prof. Walter Veit
next to his wife and
behind Prof. Josef
Wohinz with his wife

1985

Opening of the
REFA Laboratory

1989–1991

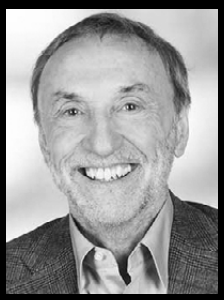
Prof. Josef
Wohinz becomes
Dean of the Faculty
of Mechanical
Engineering and
Business Economics.

1985 | 1986 | 1987 | 1988 | 1989

Prof. Ulrich Bauer
Dr. Michael Moor
Dr. Norbert Obermayr
Dr. Rupert Hasenöhrl
Dr. Thomas Stüger
Dr. Roland Falb

Summer 1991:
Bathing day
at Pörtschach

Among others
f.l.t.r.:
Prof. Josef Wohinz
Gerlinde Wohinz
Gerhard Himmer
Dr. Rudolf Pichler
Dr. Robert Lackner



1993–1996

Prof. Josef Wohinz becomes Rector of the TU Graz; during this time Hon. Prof. Alfred Janes manages the institute.

3-5 July 1991:
Workshop at
Radegund-Schöckl

f.l.t.r.:
Dr. Uwe Pölzl
Dr. Gerhard Himmer
Dr. Rudolf Pichler
Dr. Hartwin Hagen

1990	1991	1992	1993	1994

PROF. JOSEF WOHINZ

1970-2000	ANNELIESE KRENN
1976-1995	DOROTHEA KAPONAKIS

▲ Dr. Alexander Wiegele

▲ Dr. Hartwin Hagen
▲ Dr. Robert Lackner

▲ Dr. Uwe Pölzl

▲ Dr. Gerhard Himmer

▲ University Assistant ▲ Project Assistant ▲ Scientific Assistant without Doctorate

1993:
Inauguration
speech of Rector
Josef Wohinz

26 November 1993:
Inauguration of
Prof. Wohinz

f.l.t.r.:
Dr. Michael Schaller
Prof. Christian Ramsauer
Dr. Rudolf Pichler
Dorothea Kaponakis
Dr. Michael Russ
Prof. Josef Wohinz
Dr. Stefan Altenhofer
Anneliese Krenn

1999

Book presentation
of "Die Technik
in Graz" of Prof.
Josef Wohinz

1995	1996	1997	1998	1999
	SEIT 1996 JASMINE SAGRANDO			

▲ Dr. Rudolf Pichler
▲ Dr. Michael Schaller
▲ Dr. Michael Russ
▲ Dr. Stefan Altenhofer
▲ Prof. Christian Ramsauer
▲ Dr. Manfred Peritsch
▲ Dr. Hans Lercher

12 March 1999:
Celebration of the doctoral defensio of Dr. Hans Lercher

f.l.t.r.:
Dr. Erich Hartlieb
Dr. Manfred Peritsch
Dr. Hans Lercher
Dr. Klaus Offner
Dr. Reinhart Willfort

Among others
f.l.t.r.:
Dr. Klaus Offner
Dr. Reinhart Willfort
Jasmine Sagrando
Dr. Josef Tuppinger
Dr. Arthur Primus
Anneliese Krenn
Dr. Erich Hartlieb
Dr. Werner Leitner

7 June 2001:
Styrian company run

2005

Prof. Josef Wohinz becomes curator of the newly founded PSM Institute and takes over the role of program development for the new master program "Production Science and Management (PSM)".

2000 | 2001 | 2002 | 2003 | 2004 | 2005

PROF. JOSEF WOHINZ

2000-2010 UTE POINTNER

SEIT 1996 JASMINE SAGRANDO

▲ Dr. Reinhart Willfort
▲ Dr. Erich Hartlieb
▲ Dr. Klaus Offner
▲ Dr. Josef Tuppinger
▲ Dr. Arthur Primus

▲ University Assistant ▲ Project Assistant ▲ Scientific Assistant without Doctorate

11 July 2007:
IBL field trip – St. Lambrecht

f.l.t.r.:
Mario Fallast
Dr. Hannes Fuchs
Dr. Sonja Embst
Thomas Steinwender
Ute Pointner
Dr. Manfred Ninaus
Prof. Josef Wohinz
Dr. Roland Winkler
Dr. Hannes Oberschmid
Dr. Andreas Stugger

13 May 2010:
WING Congress

f.l.t.r.:
Dr. Georg Premm
Dr. Sonja Embst
Prof. Josef Wohinz
Dr. Verena Kriegl
Dr. Elisabeth Winkler
Dr. Nikolaus Mitterer

2006	2007	2008	2009	2010

▲ Dr. Werner Leitner
▲ Dr. Karl Ritsch
▲ Dr. Florian Seebacher
▲ Dr. Manfred Ninaus
▲ Dr. Roland Winkler
▲ Dr. Andreas Stugger
▲ Dr. Hannes Oberschmid

17 December 2015: Defensio of doctoral thesis of Dr. Hans Peter Schnöll

f.l.t.r.:
Dr. Mario Kleindienst
Dr. Matthias Schurig
Prof. Christian Ramsauer
Mario Fallast
Dr. Christian Rabitsch
Dr. Martin Kremsmayr
Prof. Hubert Biedermann
Jochen Kerschenbauer
Dr. Stefan Heldmann
Dr. Hans Peter Schnöll
Dr. Alexander Pointner
Martin Marchner
Dr. Matthias Friessnig
Prof. Josef Wohinz
Dr. Volker Koch
Dr. Thomas Böhm
Prof. Stefan Vorbach
Dr. Julia Heißenberger

f.l.t.r.:
Dr. Matthias Wolf
Manuel Lesser
Andreas Lukas
Theresa Huber
Atacan Ketenci
Oliver Moerth-Teo
Christoph Pirklbauer
Felix Weger
Matthias Eder
Daniela Neukam
Dr. Hugo Karre
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Prof. C. Ramsauer
Philipp Rouschal
Maria Hulla
Lukas Kreilinger
Patrick Herstätter
Martina Miskovic
Maximilian Saiko
Christoph Judmaier
Jasemine Sagrando
Dr. Hans Peter Schnöll
Michael Rossmann

2011

Prof. Christian Ramsauer becomes head of the IBL Institute and curator of the PSM Institute.

2014

Opening of the LEAD Factory

Opening of the FabLab Graz

2015

Opening of the IIM Seminar Room, the "Harvard“ Room

2011 | 2012 | 2013 | 2014 | 2015 | 2016

PROF. CHRISTIAN RAMSAUER

SEIT 1996 JASMINE SAGRANDO

2010-2016 KERSTIN HEINE

SEIT

▲ Dr. Sonja Embst
▲ Dr. Nikolaus Mitterer
▲ Dr. Hannes Fuchs
▲ Dr. Verena Kriegl
▲ Dr. Elisabeth Winkler
▲ Dr. Georg Premm
▲ Dr. Wolfgang Unzeitig
▲ Dr. Hans Peter Schnöll
▲ Dr. Matthias Schurig
▲ Christian Jungmair

▲ University Assistant ▲ Project Assistant ▲ Scientific Assistant without Doctorate

19 December 2019:
IIM Christmas celebration

28 February 2020:
IIM skiing day

2017

The two institutes IBL and PSM are merged to the Institute of Innovation and Industrial Management (IIM).

2019

Opening of the Schumpeter Laboratory for Innovation

2020

Hosting the first international academic conference in history (CLF 2020)

2017 | 2018 | 2019 | 2020 | 2021

2016 DANIELA NEUKAM

SEIT 2018 THERESA HUBER

Martin Jungreithmair
Dr. Christian Rabitsch

Dr. Matthias Friessnig
Dr. Mario Kleindienst
Dr. Markus Hammer

Dr. Stefan Heldmann
Dr. Thomas Böhm
Dr. Alexander Pointner

Dr. Martin Kremsmayr

Thomas Wildbolz

Matthias Eder

Dr. Matthias Wolf

Lukas Schwarz
Dr. Hugo Karre

△ Ongoing Doctorate

- △ Maria Hulla
- △ Andreas Kohlweiss
- △ Atacan Ketenci
- △ Marion Unegg
- △ Kai Rüdele

- △ Nils-Christian Böhnke
- △ Elias Auberger
- △ Patrick Herstätter
- △ Oliver Moerth-Teo
- △ Heimo Preising
- △ Florian Kulmer

WHAT'S NEXT

This report gives you some insights into our institute and our work. The last few years have been very exciting and full of opportunities. We established successful collaborations with many companies, connected with our talented students and expanded our great team.

In the upcoming years, we will continue to focus on our core research topics in the two working groups of Innovation and Industrial Management. We will also continue to focus on participant-centered learning methods for our students.

Soon, we will establish an Alumni network of the institute to offer a platform to connect all our former students who finished their PhD thesis and diploma/master thesis at the IIM Institute. With this initiative, we will make sure to reconnect with our network virtually. We plan a first Alumni-Meeting in 2023 with physical presence on campus.

We are all still waiting that the COVID-19 pandemic will stop influencing our daily lives. Our students are finally back on campus and it is great to work with them. It is time to meet, share and celebrate again. Soon, we have a reason for that. My long-time mentor Prof. Stefan Thomke from the Harvard Business School in the US will receive a “Honorary Doctor” from the TU Graz. This will be an important event for our institute to celebrate.

During our presidency of the international association of learning factories (IALF), we want to foster and establish our academic network in the upcoming two years. The conference in Singapore in April 2022 will be the first opportunity to meet again in person.

The International Symposium of Academic Makerspaces (ISAM) will be held at Georgia Tech in Atlanta 2022. We applied to the members of the Higher Education Makerspace Initiative (HEMI), Professors from Massachusetts Institute of Technology (MIT), Yale University, Stanford University, Georgia Tech, Case Western Reserve University, UC Berkeley and Olin College, for the conference 2023 and we have a good chance that the conference will take place for the first time outside of the US in Europe at Graz University of Technology.

For our partners in industry, we will soon offer new opportunities to collaborate. New innovation partnerships (limited to max. 10 companies) will be available from the beginning of 2023. Other project-based partnerships within the working group Industrial Management will be offered soon.

If you want to know more about us, our activities and potential forms of collaboration, do not hesitate to contact us.

We thank all contributors to the successful development of the IIM Institute at the TU Graz!

IMPRINT

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Graz University of Technology
Institute of Innovation and
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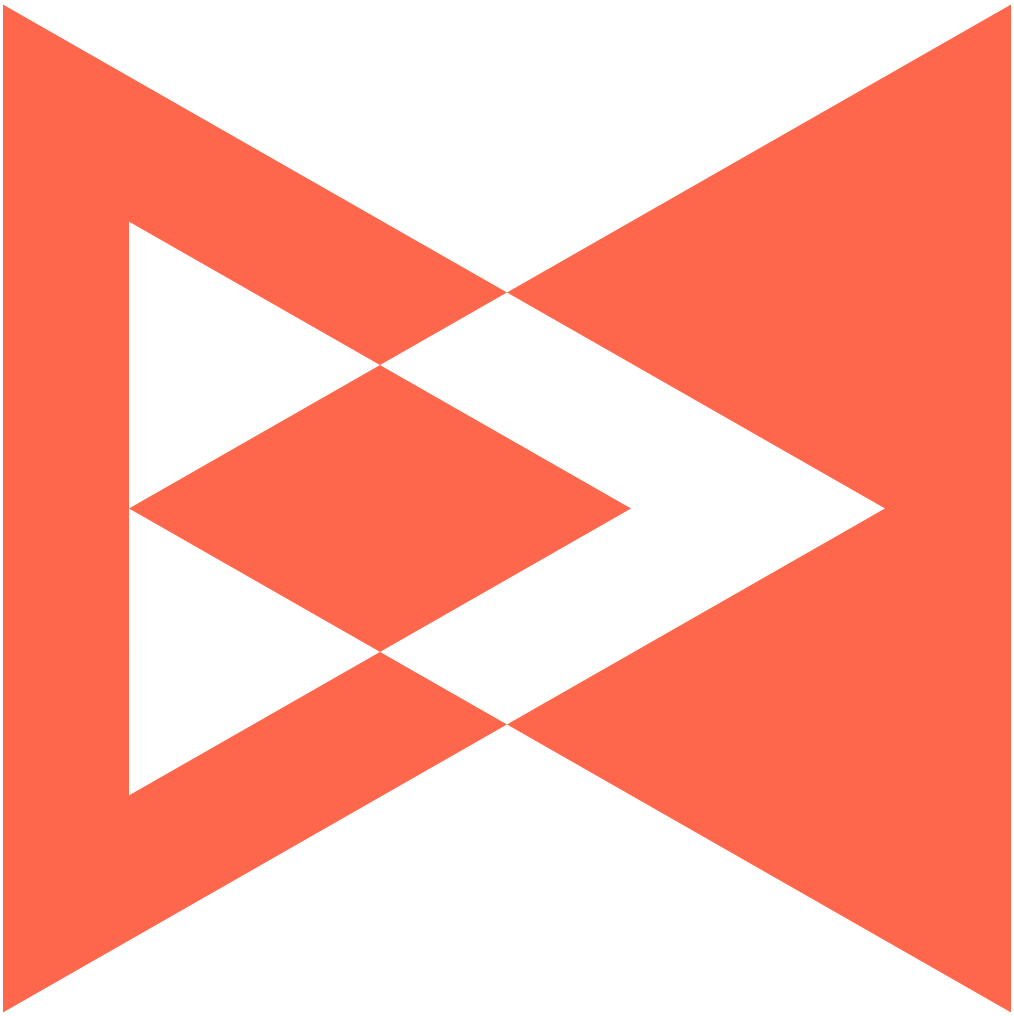

IIM REPORT 2011–2021

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