



2020 ANNUAL REPORT

Institute of Technology Management University of St.Gallen



INSTITUTE OF TECHNOLOGY MANAGEMENT UNIVERSITY OF ST. GALLEN

		Seite / Page
1/	Overview 2020	04
2 /	Research and Transfer	
	2.1 / Operations Management (Prof. Dr. E. Fleisch)	08
	2.2 / Production Management (Prof. Dr. Th. Friedli)	12
	2.3 / Innovations Management (Prof. Dr. O. Gassmann)	18
	2.4 / Entrepreneurship (Prof. Dr. D. Grichnik)	24
	2.5 / GCEI Global Center for Entrepreneurship & Innovation (Prof. Dr. J. Wincent)	28
3 /	Appendix	
	3.1 / Structure	
	3.1.1 / Institute Structure	30
	3.1.2 / Team	32
	3.2 / Education	35
	3.3 / Publications	39
	3.4 / Talks (Selection)	46
	3.5 / Permanent Tasks	50
	3.6 / Promotions	54

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1 / HIGHLIGHTS OF 2020

Every year is special, but few years have been so challenging for the whole society as 2020. As most organizations, the institute has been impacted by the COVID-19 crisis in several ways: Life events have been cancelled and projects have been postponed, reduced, or cancelled in order to maintain social distancing or reduce cash outs of our corporate partners. Teaching had to change to virtual platforms with major changes in didactic styles, the character of the lectures, and examinations.

At the same time, this year has been highly productive. Constraints driven by social distancing, home offices, and budget reductions led to high output on papers and totally new styles of teaching. Many of these lessons will be incorporated into our institute's practice.

Research

Our research is driven by our labs and the highly engaged researchers. We want to highlight a few activities:

At the chair of Prof. Grichnik, Startup@HSG is now also represented «downtown» in St.Gallen and was able to officially inaugurate the Tech Incubator Ro51 at Rosenbergstrasse in cooperation with the student union. This enables us to provide our HSG start-ups with attractive co-working offices. The «HSG Entrepreneurial Talents» program is becoming increasingly popular. In the fall semester of 2020, we had a record number of applications: More than 50 start-ups applied for the coveted Talents scholarships. From now on, several professors from the university will act as ambassadors of Startup@HSG, which are divided into different verticals, such as FoodTech, ICT, and Insurtech. The highlights of the FoodTech Lab in 2020 can be categorized along its mission with the following three goals: (1) to connect key players of the food industry, (2) to conduct evidence-based research, (3) and to support world-class ventures and students.

The chair of Prof. Fleisch focused on the strongly growing Center for Digital Health-

care Interventions. The team several large international research grants including ones funded by the U.S.A.'s National Institutes of Health and Singapore's National Research Foundation (NRF). The Center's CSS Lab served as breeding ground for Resmonics AG, a spin-off company that develops a digital biomarker for respiratory disease monitoring. Prof. Gassmann's chair continued with its research on business models in the energy and smart city field. The Bosch IoT Lab continued its research on platform patterns, data strategy, and technology commercialization with many highlights. The Helvetia Innovation Lab has successfully finished its research on the development of ecosystems in the home sector; four PhD theses and dozens of master's theses resulted out of the research lab. Prof. Friedli and his team gained three new InnoSuisse Projects (Global Production Networks, Smart Manufacturing, IoT driven Business Models in Smart Services). Moreover, the team provided the scientific conceptualization for the largest ever launched benchmarking in pharma production covering plants from 52 countries financed by the U.S. FDA and conducted together with Dun & Bradstreet. Furthermore, Prof. Friedli's team started two new benchmarking studies, one about global production network management with 88 participating global manufacturers and another one about everything-as-aservice with 130 participants.

Research output regarding publications has been exceptional: Papers have been accepted in the leading journals like the Journal of Business Venturing, the Journal of Management Studies, the MIT Sloan Management Review, Harvard Business Review, Drug Discovery Today, Long Range Planning, the Journal of Cleaner Production, the International Journal of Production and Operations Management, Production Planning & Control, Technological Forecasting and Social Change, to name the most prominent ones only. Our research has been brought to a wider audience via Forbes, several books in several languages, and ongoing social media activities.

Teaching

Teaching has been a special challenge due to social distancing since our university is a presence university. Nevertheless, the team initiated several innovative teaching initiatives: Prof. Friedli launched a new HSG CAS for Production Management together with OST. Prof. Grichnik organized a new masterlevel course, the FoodTech Rallye, with the objective to explore and analyze, together with the students, the Swiss FoodTech Ecosystem. Prof. Gassmann taught the core course on Business Innovation with over 40 teams in parallel, working competitively on 14 real business model challenges from companies. Assistant Prof. Tobias Kowatsch developed and taught the first project lecture on Digital Health to HSG Master students and the Joint Medical Master students. The constraints in the virtual teaching environment helped us fully utilizing the didactic power of digital teaching. New kinds of lectures in hybrid formats between digital and physical learnings have been developed for the purported new normal.

Peopl

Prof. Gassmann has received the HSG Impact Award together with Prof. Frankenberger. According to F.A.Z. he also belongs to the most influential economists of Germany in the Science area. Prof. Grichnik has been invited to join the editorial review board of the leading field journal Entrepreneurship Theory and Practice.

Assistant Prof. Felix Wortmann, Assistant Professor at ITEM HSG and scientific director of the Bosch Lab, successfully defended his habilitation and again received the HSG Impact Award, this time for Quartierstrom, a joint project with the Bits to Energy Lab that also gave birth to the software spin-off company Exnaton. Assistant Prof. Tobias Kowatsch handed in his habilitation thesis. Alex Ilic, a former Assistant Professor at ITEM HSG and scientific director of the HSG/ETH Auto-ID Labs also successfully completed his habilitation at HSG. He cofounded the ETH AI Center and serves as its Executive Director. Dr. Bernhard Lingens took over a new position as head of Innovation Management and board member of the Institute of Marketing and Analytics at the University of Lucerne and was also appointed as visiting professor at Aalborg University. Dr. Manuel Hess was elected as Assistant Professor in our Global Center for Entrepreneurship and Innovation. Dr. Barbara Burkhard received an offer to join Aalto University as a postdoctoral researcher.

Thanks

We are grateful to have the privilege of doing research and lecturing, especially in these difficult times. We thank our teams for their extraordinary engagement and enthusiasm for driving our topics. With head, hands, and heart we strive to make a difference.

The Management Team, 31 December 2020



Prof. Dr. Oliver Gassmann (Vorsitz) Prof. Dr. Dietmar Grichnik Prof. Dr. Thomas Friedli Prof. Dr. Elgar Fleisch

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Management
Prof. Dr. Thomas Friedli

Innovations
Management
Prof. Dr. Oliver Gassmann

Entrepreneurship

Prof. Dr. Dietmar Grichnik

Competence Centers

K. Fuchs (until Sept. 20)

AB H

DEPUTY HEAD Dr. L. Budde GLOBAL
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T. K

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Ass.-Prof. Dr.
Dr. N. Häfner

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F. Wo

BOSCH IOT LAB Ass.-Prof. Dr. F. Wortmann STARTUP NAVIGATOR LAB Ass.-Prof. Dr. M. Hess

E. Müller M.L. Fuchs

SERVICES
TECTEM

Prof. Dr.
Th. Friedli

FOR INNOVATION

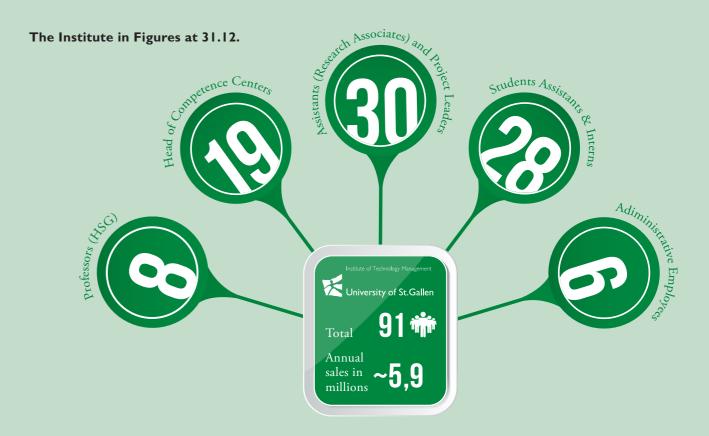
Dr. D. Vogt

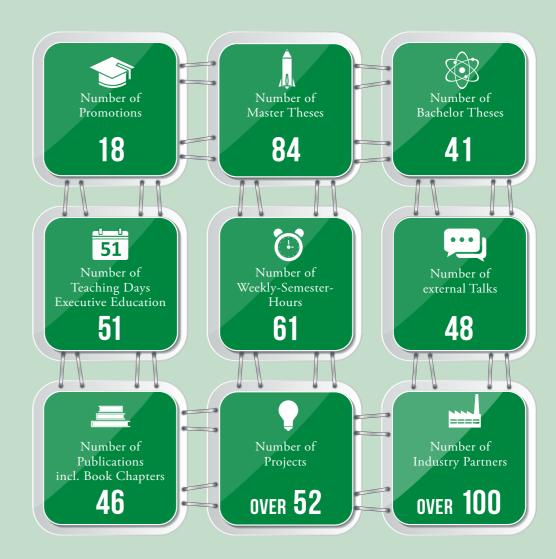
GLOBAL CENTER FOR ENTREPRENEURSHIP & INNOVATION

Prof. Dr. Joakim Wincent, Prof. Dr. Vangelis Souitaris, Prof. Dr. Charlotta Sirén

Extended Management Team









2.1 / OPERATIONS MANAGEMENT

/// Prof. Dr. Elgar Fleisch

Introduction

2020 was, as it certainly was for everyone, a demanding year full of challenges. Nevertheless, encouraging progress was achieved at Professor Fleisch's chairs at HSG and ETH. Understanding and shaping the integration of the physical and digital world remains a priority. Numerous scientific and practical successes testify to the team's enthusiasm for future health, sustainability, and jobs.

the Auto-ID Lab HSG/ETH. Hereby, automatically collected digital receipts from food purchases are processed to assess food waste behavior and create appropriate consumer interventions. In line with our strategy, the lab was successfully transferred to the newly founded ETH Center for Artificial Intelligence (https://ai.ethz.ch) by October 1, 2020. We wish the team continued success and all the best.



Yearly seminar in Bever of Prof. Fleisch's chairs (ETH & HSG).

Auto-ID Lab@ETH/HSG (www.autoidlabs.ch)

The Auto-ID Lab at HSG and ETH, which is part of a leading research network for the Internet of Things, with a focus on consumer and enterprise applications, was successful again this year. Despite adverse circumstances due to the coronavirus pandemic, we were able to continue the collaboration with our main partner GS1 in a reasonable manner. A highlight was the successful award of the SNF research grant for our ShopHero project, a joint project with the University of Zurich, ZHAW Winterthur, and

Bits to Energy Lab (www.bitstoenergy.ch)

The Bits to Energy (B2E) Lab develops digital technologies to promote sustainable consumer behavior. The team has successfully led and completed the Quartierstrom project, a flagship project supported by the Swiss Federal Office of Energy on local peer-to-peer electricity trading in collaboration with several partners from academia (incl. the Bosch IoT lab) and industry. The project has won the HSG Impact Award 2020 (see https://www.iot-lab.ch/) and additional articles on the project have been published in



Team Professor Fleisch HSG & ETH.

peer-reviewed journals (Applied Energy, Computer Communications). Additional highlights include an invited talk at Stanford University (Energy Resources Engineering seminar series) and the launch of new projects on food product purchase behavior together with the ETH Center for Artificial Intelligence and the Chair of Marketing at the University of Zurich.

Center for Digital Health Interventions (CDHI, www.c4dhi.org)

The CDHI designs chatbots and digital biomarkers to support chronically ill patients in their everyday lives. In 2020, the CDHI was able to secure funding from a number of sources for high-impact research projects. In March 2020, the five-year Future Health Technologies Programme (FHT) launched, comprising two projects with a focus on the prevention of diabetes and depression. The FHT Programme is carried out in collaboration with the National University of Singapore and Nanyang Technological University and co-funded by the National Research Foundation Singapore. In April 2020, the five-year Sweetgoals project began, which focuses on the management of type-1 diabetes with a digital coach. The project is carried out in collaboration with our partners at Dartmouth's Center for Technology and Behavioral Health and is funded by the National Institutes of Health (NIH). The CDHI continues to be involved in teaching and, in 2020, offered the first Digital Health Project lecture for master's students, as well as the first Digital Health lecture for Joint Medical Master (JMM) students at HSG. Aside from our research and teaching activities, outstanding achievements of 2020 include the foundation of a third CDHI spin-off company, Asthma Guardian by Resmonics, which supports patients with respiratory conditions.

Digital Biomarkers in Diabetes (Felix Wortmann's activities besides the Bosch Lab)

The group for Digital Biomarkers in Diabetes develops digital biomarkers based on latest sensor technology, for example, embedded in consumer devices such as smartwatches. These innovative digital biomarkers, once utilized, have the potential to support people with diabetes in their daily lives. The recently started SNF Sinergia project HEADWIND sets the ambitious goal to timely predict dangerous phases of hypoglycemia (toolow blood glucose) for people with diabetes while driving based on in-vehicle and wearable sensors. Backed by the success of HEADWIND, the lab recently expanded the project's idea to everydaylife settings with the InnoSuisse-funded project RADAR (Wearable-Based Dysglycemia Detection and Warning in Diabetes). Both projects are carried out in partnership with the lab's strong medical partner, the Inselspital Bern.



was approved by Innosuisse with a substantial

volume. In this project, we work with two global

production companies to develop a professional

strategic network KPI-cockpit. We have support

from an Industry 4.0 software provider for the

technical implementation. We also have support

from the Institute for Accounting, Controlling

and Auditing (ACA-HSG) and the Department

Production and Operations Management (POM)

of the ETHZ. Parallel to the research project, we

have also started a new benchmarking with eight

topic of «Management of Global Production Net-

works in Today's Business Environment.» Valua-

ble insights were generated within the framework

of the comprehensive study that includes a total

of 88 participating global manufacturing compa-

nies. We would like to congratulate the selected

Successful Practice companies: Hella GmbH &

consortium companies from various industries

(automotive, pharmaceutical, sensors) on the

2.2 / PRODUCTION MANAGEMENT

/// Prof. Dr. Thomas Friedli

«Hard pressed on my right. My center is yielding. Impossible to maneuver. Situation excellent. I am attacking.»

[GENERAL FERDINAND FOCH]

When we studied our forecast for the year 2020 at the end of February, we were set for a record-hitting year regarding the number of projects, turnover, and profit. Our global activities had increased again and the number of international meetings that had already been confirmed were very impressive. Then came Corona and the lockdown decision on March 16. However, we decided not to wait, but to seek ways to continue with our projects as well as our research and teaching activities in any event and stay proactive in our dealings with industry. It would be wrong to assume that there was no impact on our



Opening speech at the 2020 St. Gallen Production Management Conference, held by Prof. Friedli. business, but we could limit the impact and we even achieved a number of outstanding results. Nevertheless, it was a challenging year. Almost everything took more time in the preparation stage. Conducting digital workshops is certainly possible but has limits. The CAS Course in Production Management that we offer together with our colleagues from the Rapperswil Campus of the OST had to be postponed, but finally started in June. Our traditional Production Management Conference had to switch from a hybrid to a full virtual mode one day before the conference was due to start. Our two big industrial Operational Excellence exchange groups for the pharmaceutical industry had to be conducted entirely virtually. The challenge in this instance was to have U.S. and European participants together in one virtual meeting, while accounting for the different time zones they were in. Generally, we finally had a very successful year again with four B-Journal publications, a turnover of more than two million Swiss francs for the first time, newly acquired projects in all defined research groups, and only two projects that had to be canceled. We keep going and we adapt to the circumstances as they change. Hopefully we and our services will, in the not too distant future, be back in the physical global world of production management too, as we miss the direct in-person interaction very much.

Below are a number of highlights from the three groups Global Production Management, Operational Excellence, and Smart Manufacturing and Services.

Global Production Management

The Global Production team started the year with the successful completion of two individual projects: production strategy development and core process optimization at an automotive supplier in Germany, as well as the development of a COO organizational structure at a Swiss aircraft component manufacturer. Furthermore, we started the research project titled «Intelligence-Based Manufacturing Networks, «which



the study. Moreover, we also pushed ahead with our Manufacturing Network Assessment, which we set up last year. Here we collaborated with a crystal glass manufacturer from Austria and a manufacturer of pharmaceutical packaging from Switzerland. In addition, this year we conducted the Swiss Manufacturing Survey for the fourth time to assess the situation of the Swiss manufac-

Co. KGaA, Hilti AG, Infineon AG, Jenoptik

AG, and Komax AG. An intensive exchange of

ideas with these companies took place following

turing industry. The Corona pandemic made up its own survey part of the study. We congratulate Integra Bioscience AG on winning the Swiss Manufacturing Award. The company was announced as the winner and honored at this year's St. Gallen Production Management Conference.

St. Gallen Production Management Conference In addition to the conference, the 3rd Global Production Expert Forum was held in cooperation with our partner institutes RWTH WZL Smart manufacturing & services focus group meeting in Berlin.

Final web conference of this year's global production consortium benchmarking.

and KIT wbk. Here, we were also able to obtain interesting practical insights from Volkswagen AG, Henkel AG, and Bühler. On the publication side, we achieved a number of high-ranking publications from the field of global production. Furthermore, we currently collaborate with our partner from ETHZ POM on an article titled «Management Control for International Manufacturing Networks« to be published next year in a special issue of the Swiss journal Die Unternehmung. Another highlight will be the new edition of the book titled Management of International Manufacturing Networks, which we are currently working on based on the findings of the past years.

Operational Excellence

2020 was a very challenging but successful year for the research team Operational Excellence. All prioritized research fields continued to grow and we supported eight pharmaceutical companies from the U.S. and India in individual collaboration projects focusing on quality processes and key performance indicators. Collaboration partners included the who is who of leading pharmaceutical companies, such as Pfizer and Johnson & Johnson. Based on learnings from benchmarking activities and the adaption of lean principles, increasing effectiveness and efficiency in quality control labs stays a top priority for both industry and our researchers. Furthermore, conceptualizing, deploying, and sustaining production systems within and across pharmaceutical production kept us busy.

Conducting the biggest quality benchmarking study in the world, executed in collaboration with Dun & Bradstreet and funded by the U.S. Food and Drug Administration (FDA), significantly increased the visibility of our research group around the globe. We are proud to state that «St. Gallen» is a widely known brand in the

pharmaceutical manufacturing and quality community - associated with the number one academic institution for scientific support in striving for operational excellence. Hence, we have been invited to and delivered speeches at numerous (virtual) conferences, such as the ISPE Annual Meeting and Pharma TechOps. Moreover, we celebrated 15 years of operational excellence this year by organizing two anniversary conferences for our partners based in Europe and the U.S. We look back on outstanding achievements in 2020. Nevertheless, it is fair to point out the tremendous amount of extra work that was brought about by the COVID crisis. A perfect example is the need to fundamentally redesign the well-established concepts of our two industry exchange groups involving more than 20 pharmaceutical companies in total.

Smart Manufacturing and Services

In 2020, the team further explored innovative approaches for industrial firms to offer, innovate, and sell advanced services. Our project and research activities identified Equipment-as-a-Service as a strategic opportunity for manufacturers to seize in the years to come. An in-depth assessment of 140 participants of our Everythingas-a-Service (XaaS) benchmarking study revealed nine success factors in transitioning toward «as-a-Service» models. These insights build the foundation for our forthcoming Innosuisse project IoT-enabled Business Models. We will support eight manufacturers in developing new commercial and operational models for their digitally enabled service business. Furthermore, we made important advancements in the development of a formalized smart service innovation process. Together with six industrial firms, we developed key dimensions of the smart service innovation process in the focus group Service Innovation. The major findings were applied

and expanded in ongoing engagements with two Swiss industrial leaders. Furthermore, we substantiated our authoritative position in the realm of smart service commercialization. In our Innosuisse project Value-based Marketing & Sales of Smart Services completed in October, we conceived novel value-based pricing and selling approaches for five manufacturers. The project findings were expanded in three subsequent initiatives. First, we teamed up with FIR from RWTH Aachen University to further explore Pricing Digital Products in a consortium project reuniting eleven firms from diverse industries. Second, our new Sales Diagnostic screened through service sales organizations worldwide identified nine levers firms should pull to sell services successfully. The diagnostic study findings serve as an empirical foundation for our new focus group Commercialization of Smart Services, scheduled for the second half of 2021. Third, the team currently works on disseminating the findings of their diverse activities to the broader public. Seminars, as well as practitioner and academic publications, are under preparation and will be released in spring 2021.

Outlook

Our goal is and remains to play a leading role in production management research and to have a real and visible impact on industry practice. We will continue to shape our activities globally while living up to our regional responsibility and always look for solutions instead of complaining about the circumstances.



2.3 / INNOVATIONS MANAGEMENT

/// Prof. Dr. Oliver Gassmann

Impact awards and more

As mentioned in the introduction, 2020 has been a very special year for our institute. The social-distancing environment has been challenging. In contrast to other industries, we have the privilege of being able to work efficiently and effectively even in a home office environment. The team at Prof. Dr. Oliver Gassmann's Chair for Innovation Management produced excellent work in 2020. The constraints of social distancing were turned into an asset; the hurdles of less meetings became an opportunity to focus on research papers.

As a result, the labs again pursued their goal of combining rigor with relevance successfully.

We have succeeded not only in publishing very successfully but also won the University of St.Gallen's Impact Award 2020 (Asst.-Prof. Dr. Felix Wortmann with the peer-to-peer energy network, Quartierstrom, and Prof. Dr. Oliver Gassmann together with Prof. Dr. Karolin Frankenberger for «Sustainable Business Model Innovation for the Circular Economy»). Our publication entitled «The upside of being a digital pharma player» in Drug Discovery Today has been discussed in Forbes and achieved more than 100,000 views in a few hours.

Prof. Dr. Oliver Gassmann is again listed in the Frankfurter Allgemeine Zeitung Ranking 2020, under the section Science, as one of Germany's most influential economists.

Ecosystem Innovation Lab

The Ecosystem Innovation Lab, formerly Helvetia Innovation Lab, focuses on the phenomenon of innovation ecosystems. We contribute to the understanding of how companies co-create overarching value propositions for end customers. Our research focuses on the design of the value proposition, governance, and organizational structures of ecosystems. For this purpose, we

collaborate with partners from academia (Aalborg University, Aarhus University, both Denmark) and practice (Deloitte, Helvetia). In 2020, our team successfully completed the collaboration with Helvetia Insurance, where we supported its ecosystem «home» initiative.

Dr. Bernhard Lingens, who has been leading the lab until May 2020, has been accepted to become a director at the newly founded Institute for Marketing at the University of Lucerne and accepted a Visiting Professorship at the University of Aalborg, Denmark. Three PhD theses have been finalized this year along with several publications, for example, Long Range Planning. Another PhD thesis will be finalized in spring. The lab has been a successful initiative to further develop previous research strength on business model innovation and open innovation toward the development of ecosystems.

Bosch IoT Lab

Headed by Dr. Wolfgang Bronner (Director Bosch) and Asst.-Prof. Dr. Felix Wortmann (Scientific Director), the Bosch IoT Lab investigates Internet of Things (IoT) business models. Furthermore, the Bosch IoT Lab explores disruptive IoT products and services. The laboratory's activities focus on three domains. First, the focus is on IoT business models and IoT business model transformation. Second, research activities are geared toward IoT platforms and corresponding platform business models. Lastly, within its IoT technology exploitation domain, the lab investigates new opportunities in the realm of driver monitoring and safety. In 2020, the lab received the HSG Impact Award for the second time since 2019. The price was awarded to Quartierstrom, Switzerland's first peer-to-peer energy market platform. Research results were published in renowned journals like Applied Energy and Industrial Marketing Management.



Energy Innovation Lab

The Energy Innovation Lab (headed by Asst.-Prof. Dr. Maximilian Palmié) has continued its work on how organizations can utilize digital technologies in order to progress toward social, environmental, and economic sustainability. This overarching question guided us in our ongoing involvement in the Swiss Competence Center for Energy Research (SCCER) CREST, where we lead the work package «Energy, Innovation, Management,» and the EU Horizon 2020 project entitled »Smart and Inclusive Solutions for a Better Life in Urban Districts.»

In addition to these long-standing efforts, we started a new project in 2020: We are now

engaged in a consortium studying the replication and upscaling of Smart City (SC) solutions and the formation of a SC industry in Switzerland. This project, which is called «Scaling Smart City Projects - from Individual pilots towards a Common strategy of industry Emergence» and which is funded by the Swiss National Science Foundation in the context of its National Research Program on Digital Transformation (NRP 77), adopts an integrative strategic approach to support smart city projects, combining user/citizen, organizational, and systemlevel perspectives. This project allows us to build on and extend our business model competences in the area of social, environmental, and economic sustainability.

Our traditional PhD seminar, at Säntis.

Moreover, we have assumed the responsibility for one of the newly created Capstone Project courses at HSG's bachelor's level where we facilitate groups of students to work on real-life challenges related to sustainable business models. Our research insights have been featured in

Emerging Technologies Lab

Asst.-Prof. Dr. Naomi Haefner currently leads the Emerging Technologies Lab, which examines the management implications of key next-generation technologies. The Lab conducts research on artificial intelligence (AI) and distributed ledger



Online teaching as the new normal.

several publications, including an article in the Journal of Cleaner Production, the number one journal publishing on sustainability, according to Google Scholar. Moreover, our article in the prestigious Strategic Entrepreneurship Journal has received an Impact Award from Wiley for the second year in a row.

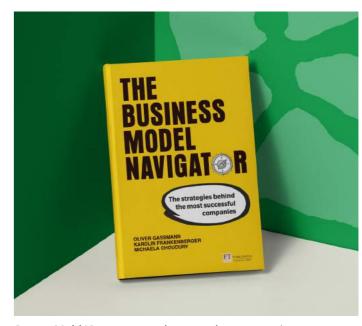
technologies (DLT) in the context of management and innovation practice. We study the impact of emerging technologies on both the value creation and value capture processes of firms. Specifically, we have research projects on how AI affects managerial decision-making and innovation. Furthermore, we currently study

appropriability issues associated with AI-based firm strategies. Finally, we are developing new business models and governance models for the digital age. Our research has been published in Technological Forecasting and Social Change.

Teaching and Books

As always, we taught courses at all university levels. Prof. Gassmann taught multiple modules on technology and innovation as well as business model innovation in the Executive MBA and MBA programs. The basic master course, Business Innovation I, in the master's program of the same name has been a highlight again: 15 companies like Aesculap, BMW, Bosch, Feldschlösschen, Helvetia, and Siemens have submitted challenges on business model innovations to more than 200 of our master's students. This coaching intensive course has been a true teaching innovation: The students have learned the whole content before the course and focused for the entire duration of the course on problem solving of real challenges. Despite the virtual character, the course was received very positively by both sides - the students and the managers. The traditional flagship seminar «HSG Highlights 2020», which Prof. Gassmann developed and led for the Executive School and the HSG Alumni, have been very successful again. Several invited keynotes like the opening speech for the ISPIM and the Business Model Conference were conducted virtually.

During the lockdown we had the opportunity to finalize the 2nd edition of our global bestseller Business Model Navigator, which we updated and reworked completely. The book has now appeared in more than two dozen languages; the German version has also been updated. We were also able to finalize our book on patent management.



Business Model Navigator 2.0 with more emphasis on testing'.

How to manage patents globally and in different industries?.





2.4 / ENTREPRENEURSHIP

/// Prof. Dr. Dietmar Grichnik



Team Event January 2020.

In our Research Decision-Making Lab, we reached an all-time high with our publications. Five publications have been accepted – with great resonance also in the non-scientific community - by TOP 50 journals used by the Financial Times (FT50). Two articles in the MIT Sloan Management Review analyze the Covid-19 impact on firms - the analysis is based on satellite data about light emissions and pollution. Three articles - i.e. one article each in in the Harvard Business Review, the Journal of Business Venturing, and Entrepreneurship Theory and Practice - compare early-stage investments of business angels' human intelligence with the artificial intelligence of an algorithm enhanced with social media coverage of the portfolio firms. Finally, as a result of our SNF project together with a team of ETH scholars we could publish our paper «Leader Emergence in Nascent Venture Teams» in the Journal of Management Studies.

Since September, our Startup@HSG Lab is now also represented «downtown» in St.Gallen and

was able to officially inaugurate the Tech Incubator Ro51 at Rosenbergstrasse 51 in September in cooperation with the student union. This enables us to provide our HSG start-ups with coachings and co-working offices. The premises are also suitable for larger events and workshops and we are looking forward to a new important step in our start-up support. The «HSG Entrepreneurial Talents» program is becoming increasingly popular. In the fall semester of 2020, we had a record number of applications: More than 50 start-ups applied for the coveted Talents scholarships. Another piece of good news from the talents area: With the support of the Metrohm Foundation in Herisau, we will also ensure the promotion of talent in 2021. With a little delay and on a smaller scale than usual, but still just as festive, we awarded Julian Teicke as HSG Founder of the Year 2020 in September in Zurich. He founded the InsureTech company «wefox». The company is growing rapidly and is already on the road as a stately unicorn. Julian is also a man with inspiring visions and we will certainly hear a lot about him in the future. The HSG Spin-Off Barometer 2020 was entirely dedicated to the topic of Corona and provided interesting insights into how our spin-offs have dealt with the crisis. Fortunately, the number of spin-offs is also steadily increasing and we can already count more than 150 companies among the HSG spin-off community. From now on, several professors from the university will act as ambassadors of Startup@HSG, which are divided into different verticals, such as FoodTech, ICT, and InsureTech. We are looking forward to a strong partnership within the university institutions. Bernd Schneider joined our Startup@HSG team as PHD candidate and Startfeld delegate.

The highlights of the FoodTech Lab in 2020 can be categorized along its mission with the following



Professor Grichnik at the Frankfurt Digital Finance Conference in February 2020.

three goals: (1) to connect key players of the food industry, (2) to conduct evidence-based research, (3) and to support world-class ventures and students. Our highlight for the first goal was to connect key players of the food industry with our students through a new series of (online) panel discussions with the titel «Future of Food» involving C-level participants as well as promising start-up founders in this sector. Furthermore, the Foodtech Lab could secure a long-term research funding partnership with Nestlé with the objective to analyze FoodTech Trends, technologies, and their possible business opportunities. For the third goal of supporting world-class ventures and students, the Food-Tech Lab is proud to announce the selected candidates of the Unilever Food Innovation Challenge, which encompasses a tailor-made food start-up accelerator program for students and entrepreneurs alike. Furthermore, we set-up the FoodTech Rallye, with the goal to explore and analyze, together with the students, the Swiss FoodTech Ecosystem. Overall, we can look back on a very promising start of the FoodTech Lab in 2020 and we are excited about what the new year will bring for us.

The St.Galler Startup Navigator Lab has successfully launched its English edition of the book Startup Navigator with MacMillan Publishers an award-winning global publishing house for higher education. This book is a first of its kind integrating dynamic QR codes that link book content to our unique App with additional tools and concepts for venture development. With this publication, we have created not only an English version but also more advanced interactive content that enables learning and application for venture development by using offline and online formats creating aha moments for its users. Parts of this content is fed by the numerous research projects within the Startup Navigator lab that involves eight PhD students and research projects in 2020.



Prof. Dr. Dietmar Grichnik has been invited to join the editorial review board of our leading field journal Entrepreneurship Theory and Practice. Dr. Manuel Hess was elected as Assistant Professor in our Global Center for Entrepreneurship and Innovation by the School of Management, complementing our teaching portfolio with a bachelor course for Start Global (together with Prof. Grichnik) and two courses – Entrepreneurial Finance and Venture Growth Hacking – in the Master of Business Innovation. Dr. Barbara Burkhard received an offer to join Aalto University as a postdoctoral researcher in 2021. We congratulate Dr. Dominic Knape on his completed dissertation.

He stays at the Chair on a part-time basis to support our activities in the Startup Navigator Team.

STARTUP NAVIGATOR
GUIDING YOUR ENTREPRENEURIAL JOURNEY

DIETMAR GRICHNIK - MANUEL HESS
DIEGO PROBST - TORBEN ANTISTER - BISTIA PUKALL

Startup Navigator Book and App.

Award Ceremony HSG Founder of

Julian Teicke – Wefox.

the Year 2020,

2.5 / GLOBAL CENTER FOR ENTREPRENEURSHIP & INNOVATION

/// Prof. Dr. Joakim Wincent, Prof. Dr. Vangelis Souitaris, Prof. Dr. Charlotta Sirén

2020 was an outstanding year for the Global Center for Entrepreneurship & Innovation (GCEI) that solidified its foundation. Besides the highly reputable core team and the visiting professors linked to GCEI, two outstanding entrepreneurship professors are now part of the

center, Associate Professor Charlotta Sirén (from the University of Queensland, Australia) and Isabella Hatak, Full Professor for Management of Small and Medium-sized Enterprises (from the University of Twente, Netherlands). Both professors are strong in the three pillars that characterize the GCEI foundation: outstanding work in research, teaching, and practice. Over the past year, the GCEI team delivered numerous top-level journal publications, offered a truly excellent teaching portfolio, and established itself as a preferred practice project partner for indus-

try partners. The GCEI continues to deliver the highest quality and the very highest impact.

In 2020, the GCEI members contributed with the highest standards when it comes to academic articles in top journals. For example, Professor Thomas Zellweger and Bill Schulze published «Property Rights, Owner-Management, and Value Creation» in the Academy of Management Review, the leading journal in theory development in management research. Thomas Zellweger and coauthors also published «Ownership competence» in the Strategic Management Journal. As another example, Charlotta Sirén, Dietmar Grichnik Joakim Wincent, and coauthors published «Do Algorithms Make Better and Fairer - Investments Than Angel Investors?» in the Harvard Business Review. The team also made recognized contributions to support companies in the specific challenges caused by the COVID-19 pandemic. The authors published «Monitoring the COVID-19 Crisis From Space» and «How Companies Can Respond to the Coronavirus» in the MIT Sloan Management Review very early in the pandemic, when the world still struggled to understand the virus's consequences. Professor Oliver Gassmann and coauthors published the article «The Upside of Being a Digital Pharma Player» in Drug Discovery Today, which was featured in Forbes with interviews of the authors. These are all examples of the GCEI DNA: high-quality contributions to prestigious outlets that make a significant impact.

GCEI members also received prestigious awards and appointments that acknowledged our competence, high standards in science, and efforts to contribute to industry. For example, Professor Thomas Zellweger and his team had two papers



selected for the Best Paper Proceedings of the 2020 Meeting of the Academy of Management. This is the largest and most prestigious management conThe GCEI continues to share its knowledge and deliver high standards in education at the University of St.Gallen and other high-end universities.



ference in the world. Professor Oliver Gassmann and coauthors won the HSG Impact Award for «Business Model Innovation for the Circular Economy.» Many GCEI members were selected as editors or editorial members of leading entrepreneurship journals. This year, Dietmar Grichnik was appointed to the editorial board of Entrepreneurship: Theory and Practice, where he joins four other GCEI members. Moreover, Professors Thomas Zellweger and Oliver Gassmann were again listed in the F.A.Z. Rankings as two of the most influential economists in the German-speaking world.

The GCEI team continued to successfully teach at the bachelor's, master's, PhD, and executive levels. Due to its practical ambitions, the GCEI also cooperates with leading companies. The GCEI grows and now consistently delivers the highest standards of research, teaching excellence, and industry practice. As our high-quality output continues to expand, we are convinced that the GCEI exhibits leading capabilities in the areas of entrepreneurship and innovation in the world.

3.1 STRUCTURE

3.1.1 INSTITUTE STRUCTURE

Directors

Prof. Dr. Oliver Gassmann
Prof. Dr. Elgar Fleisch
Director
Prof. Dr. Thomas Friedli
Director
Prof. Dr. Dietmar Grichnik
Director

Executive Committee

Prof. Dr. Johannes Rüegg-Stürm

Prof. Dr. Torsten Tomczak
President
Franziska Tschudi Sauber
Vice-President
Dr. Markus Frank
Quaestor
Benedikt Würth



«Foundation for the Promotion of Technology Management, Technology Policy and Technology Transfer» – Advisory Council of the ITEM-HSG

Board

Franziska Tschudi Sauber / Weidmann Holding AG / CEO President

Dr. Markus Frank, ES-HSG / Executive Director

Benedikt Würth, Ständerat

Prof. Dr. Torsten Tomczak, ICI-HSG / Director Prof. Dr. Johannes Rüegg-Stürm, IMP-HSG / Director

Prof. Dr. Oliver Gassmann, ITEM-HSG / Director Secretary

Honorary Members

Prof. em. Dr. Dr. h.c. Hans Dieter Seghezzi Honorary Member Peter J. Hauser Honorary Member

Members

Frank Bellemans

SCHOTT Schweiz AG / Managing Director

Martin Blum

Julius Blum GmbH / Geschäftsführer

Prof. Dr. Roman Boutellier

ETH Zürich / Universität St. Gallen

Reinhard Braun

Pantec Biosolutions AG / CEO

Jens Breu

SFS Group AG / CEO

Dr. Bruno Damann Kanton SG Gesundheitsdepartement / Regierungspräsident

Prof. em. Dr. Walter Eversheim WZL RWTH Aachen

Prof. em. Dr. Fritz Fahrni ETH Zürich / Universität St. Gallen

Dr. Christof Germann Illwerke VKW AG Bregenz / Vorstandsmitglied / Direktor

Peter Gerner Hoval Gruppe Vaduz / co-CEO

Dr. Philipp Gmür Helvetia Gruppe / Vorsitzender der GL, CEO

Calvin Grieder Bühler AG / VR-Präsident

Adrian Hasler Regierung Fürstentum Liechtenstein
Urs Kaufmann HUBER+SUHNER AG / VR-Präsident

Günther Lehner ALPLA-Werke Alwin Lehner GmbH & Co. KG / CEO

Christian Mehling Lista Office LO AG / Geschäftsleitung

Grégoire Poux-Guillaume Sulzer AG / CEO

Thomas H. Rüegg

Baumann Group AG / CEO

Urs Ryffel

HUBER+SUHNER AG / CEO

Dr. Frank Schaum

Gallus Ferd. Rüesch AG / CEO

Peter Schönenberger

Altregierungsrat St. Gallen

Prof. Dr. Günther Schuh

Lehrstuhl für Produktionssystematik, WZL RWTH Aachen

Dr. Pepe Sonderegger ks treuhandexperten ag / Universitätsrat
Heinrich Spoerry SFS Group AG / VR-Präsident
Thomas Trachsler Die Mobiliar Versicherungen / CEO

Dr. Daniel Tschudi Weidmann Holding AG / Mitglied der Geschäftsleitung

Alexander von Witzleben Arbonia Management AG / CEO

Jürg Zumtobel Group AG / Vorsitzender des Aufsichtsrates

Dr. Manfred Zurkirch Ferag AG / CEO

3.1.2 TEAM

Professors (ITEM) Professors (GCEI)	Prof. Dr. Elgar Fleisch Prof. Dr. Thomas Friedli Prof. Dr. Oliver Gassmann Prof. Dr. Dietmar Grichnik Prof. Dr. Joakim Wincent GCEI Prof. Dr. Vangelis Souitaris GCEI Prof. Dr. Marc van Essen GCEI (31.08.2020) Prof. Dr. Charlotta Sirén GCEI		Lucas Miehé Eduard Müller Philipp Osterrieder (30.06.2020) Dominik Remling Jana Reuther Marten Ritz Jonathan Rösler Fabian Schäfer Barbara Schmidt
Admin/Personal Assistants	Sonja Baumgartner Ursula Elsässer Jörg Klaus Manuela Landert Corinne Metzger Elisabeth Vetsch		Kilian Schmück Bernd Schneider Robert Schreiber Veronika Seeholzer (31.05.2020) Gian-Andri Steiger Peter Tinschert (29.02.2020) Maximilian Richter
Project Leader/Ass. Profs.	Dr. Lukas Budde Dr. Naomi Häfner Dr. Manuel Hess Dr. Tobias Kowatsch Dr. Bernhard Lingens (31.07.2020) Dr. Maximilian Palmié Diego Probst Dr. Felix Wortmann	Project Staff	Dr. Torben Antretter Dr. Wolfgang Bronner Dr. Barbara Burkhard Maria Luisa Fuchs Prof. Dr. Heiko Gebauer (31.08.2020) Dr. Dominic Knape Dr. Henrik Wesemann
Assistants	Matteo Bernasconi Barbara Bencsik Christoph Blum Maximilian Böger (31.08.2020) Raphael Bömelburg (29.02.2020) Moritz Classen Ferdinand Deitermann Steffen Eich (31.10.2020) Christian Elbe Svetlana Flankova Mark Grothkopp Florian Huber (31.12.2020) Michael Hudecheck Sven Jung Kevin Koch Claudio Lamprecht Charlotte Lekkas Lars-Julian Macuvele (30.09.2020) Philipp Miedler	Student Assistants	Kay Beeler Hanna Bencseky Wanja Butz Anna Bünter (30.06.2020) Morris Campbell (31.07.2020) Fabiola Lena Capiello Segura (31.01.2020) Leopold Cercelius (30.06.2020) Valentin Coronado (31.12.2020) Alexander Churyukanov (29.02.2020) Janine Crivelli Kevin Eggel (31.01.2020) Jonathan Erba Evelyne Erni (31.07.2020) Anouk Frieden (31.01.2020) Andreas Gafner (31.05.2020) Nicolas Gilgen (30.09.2020) Lorenz Haase Christian Hagenauer Laura Marie Hansmann (31.01.2020) Dominik Hecke Céline Kuonen

3.2 EDUCATION

Kamila Isamilova (31.07.2020)

Timon Kayser (31.08.2020)

Zara Khan

Shari Shirin Klein (31.05.2020)

Johanna Knapp (31.12.2020)

Terence La (31.05.2020)

Selina Lorenz (31.01.2020)

Manzanares Estanislao (31.12.2020)

Aurelio Mauchle (30.06.2020)

Anastasija Marinkovic (31.01.2020)

Manuel Meier (31.01.2020)

Florian Münch (30.06.2020)

Valentin Nikolaev

Sarah Nordt

Stephan Paul (31.12.2020)

Benedict Pöhnert (30.06.2020)

Nikolas Rössler (14.11.2020)

Stephanie Rüegger (31.12.2020)

Florian Schabus (30.11.2020)

Julius Schilling (15.10.2020)

Stefan Schlatter (30.06.2020)

Irina Schreiber (30.06.2020)

Alexandra Schweikert (30.11.2020)

Tihomir Tsenkulovski (31.08.2020)

Camillo Visini

Maria Volkmann (30.09.2020)

Jonathan Vossen (31.12.2020)

Natalie Weiler (31.03.2020)

Nina Wiedemann (14.12.2020)

Florian Wirth

External PhD Candidates

Tatjana Christen (Prof. Dr. D. Grichnik) Sopfie Romeiss (Prof. Dr. D. Grichnik) Yaro Wolff (Prof. Dr. D. Grichnik)

Military Liaison Office of the University of St. Gallen:

Jorge Sion

Prof. Dr. E. Fleisch

- » Einführung in das Operations-Management German, Bachelor Level (4./6. Sem.)
- » Doctoral Research Seminar: Operations and Informations Management
- » Doctoral Research Seminar: Current research topics in Technology and Information Management

Lectures at the ETH Zürich

- » Next-Generation Information Systems (PhD-Level)
- » Mastering Digital Business Models, Master Level D-MTEC

Ass.-Prof. Dr. F. Wortmann

- » Einführung in das Operations-Management German, Coaching, Bachelor Level (4./6. Sem.)
- » Introduction to Operations Management Digital, Englisch, Bachelor Level (4./ 6. Sem.)
- » Platform Economy, Masterstufe SoM
- » Senior Management Program CAS HSG 2019: From the Internet of Things to the Economy of Things
- Executive MBA 57 Hauptkurs, Technologie- und Innovationsmanagement:
 Business Model Innovation in the Internet of Things
- » Executive MBA 58 Hauptkurs, Technologie- und Innovationsmanagement: Business Model Innovation in the Internet of Things
- » Executive MBA 59 Hauptkurs, Technologie- und Innovationsmanagement: Business Model Innovation in the Internet of Things
- » EMBE CAS Transformation Gestalten Digital Transformation: From the Internet of Things to the Economy of Things

Ass.-Prof. Dr. T. Kowatsch

- » Digital Health, Englisch, Joint Medical Master, School of Medicine
- » Digital Health Project, Englisch, Master level, School of Management
- » Executive MBA 57, Technologie- und Innovationsmanagement, Guest Lecture on Digital Biomarkers & Digital Pills
- » Executive MBA 58, Technologie- und Innovationsmanagement, Guest Lecture on Digital Biomarkers & Digital Pills
- » Executive MBA 59, Technologie- und Innovationsmanagement, Guest Lecture on Digital Biomarkers & Digital Pills

Lecture at the University of Zurich

» CAS in Gesundheitspsychologischer Lebensstiländerung und Mind Body Medicine, Mobile Sensing Modull

Lectures at ETH Zurich

- » Digital Health, English, Master level, D-MTEC
- » Digital Health Project, English, Master level, D-MTEC

Prof. Dr. Th. Friedli

- » Business Excellence (4. Sem.)
- » Doktorandenseminar: Kolloquium zur Forschung im Produktionsmanagement
- » Produktionsmanagement (7. Sem.)
- » Operative Exzellenz (OPEX) (7. Sem.)
- » Doktorandenseminar: Methoden des Technologiemanagement
- » Management of Industrial Companies (4. Sem.)
- » Seminar Militärische und zivile Führung: Entscheidungsprozesse als Grundlage (Kontextstufe)
- » Industrie 4.0 Smart Production und Services (7. Semester)

Lectures held at other Universities

- » IIMT, Universität Fribourg, Process & Excellence Management
- » SMBS, University of Salzburg Business School, Executive MBA, Qualitäts- und Prozessmanagement
- » RWTH Aachen: Doktorandenseminar Forschungsmethodik

Prof. Dr. Oliver Gassmann

- » Innovationsmanagement (4. Sem., Bachelor)
- » Business Innovation I (7. Sem., Master)
- » Platform Economy (8. Sem., Master)
- » Theories in Business Innovation (PhD)
- » Publishing in Management, Technology and Innovation (PhD with ETH und EPFL)
- » Forschungsschwerpunkt Innovation (PhD)
- » EMBA 57, 58 und 59 Technology- and Innovation Management
- » CAS HSG Transformation, Innovation Management
- » MBA-HSG, Business Model Innovation
- » Academic supervisor «HSG-Highlights 2020»
- » Fraunhofer Academy, Research Management

Asst. Prof. Dr. Maximilian Palmié

- » Capstone Project: Operations and Innovation Management (5. Sem., Bachelor)
- » Innovation und Führung (8. Sem., Master)
- » Managing Global Innovation (8. Sem., Master)
- » FPV: Innovationsmanagement im Energiesektor (8. Sem., Master)
- » Theories in Organization & Information Systems (PhD)

Asst. Prof. Dr. Naomi Häfner

- » Innovation Management (5. Sem., Bachelor)
- » FPV: AI Strategien entwickeln (9. Sem., Master)

Prof. Dr. Martin Bader

- » R & D Management (7. Sem., Master)
- » RPV: Intellectual Property Management (7. Sem., Master)

Prof. Dr. Christoph Wecht

- » Kreativitätstechniken für Innovationsteams (3. Sem., Bachelor)
- » Forschungs-, Praxis-, Ventureprojekt (7. Sem., Master)

Prof. Dr. Maximilian von Zedtwitz

- » Doing Business in China (3. Sem., Bachelor)
- » Managing Innovation in China (4. Sem., Bachelor)

Prof. Dr. D. Grichnik

- » Entrepreneurship: Grundlagen und Praktische Anwendungen (Bachelor)
- » Start Global (Bachelor)
- » Lean Startup, zusammen mit Prof. Dr. Jan Brinckmann, ESADE Business School (Master)
- » Startup Rallye (Master)
- » Technologie Entrepreneurship (Master)
- » PhD Colloquium Entrepreneurship I + II
- » Entrepreneurship (IEMBA 7 Programm: Hauptdozent)
- » Entrepreneurship (EMBA 55 Programm: Hauptdozent)
- » CAS Digital Leadership & Transformation
- » CAS Digital Insurance Transformation
- » CAS-HSG Recyclingmanager
- » Research Paper Clinic (EU KEEN-Project)

Dr. Manuel Hess

- » Start Global (Bachelor)
- » Methods: Venture Growth Hacking (Master)
- » Entrepreneurial Finance (Master)
- » Entrepreneurship (IEMBA 7 Programm)
- » Entrepreneurship (EMBA 55 Programm)

Prof. Dr. Joakim Wincent

- » Paper clinic in general management (PhD)
- » Becoming a top scholar seminar (PhD)
- » Technology Entrepreneurship (Master)
- » International Entrepreneurship (Master)
- » Entrepreneurial Finance (Master)
- » Essence of Entrepreneurship at Hanken School of Economics (Master)
- » Entrepreneurship for PhD candidates in Finland (PhD)
- » Business experience at Hanken School of Economics (Master)
- » International business experience at Hanken School of Economics (Master)

Prof. Dr. Vangelis Souitaris

- High Growth Entrepreneurship. An international applied perspective, at St. Gallen (Masters level – MBI and MUG)
- » Getting Ready to Become a Top Scholar, at St. Gallen (PhD and Post-doc level)
- » Innovation and Entrepreneurship at Cass Business School (MBA, Executive MBA and Dubai MBA)
- » High Growth Entrepreneurship at Cass Business School (Master)
- » Entrepreneurship, at International Hellenic University (MBA)

Prof. Dr. Charlotta Sirén

- » Experimental Research Methods (PhD)
- » Theory of Entrepreneurship and Innovation at University of Queensland (Honors)
- » Creativity for Innovation and Design Thinking at University of Queensland (Master)

3.3 PUBLICATIONS

Books

Friedli, T., Köhler, S., Calnan, N., (2020). Quality Control Lab: A Crucial Contributor to Pharmaceutical Value Creation and Quality System Performance. Editio Cantor Verlag: Aulendorf

Gassmann, O.; Bader, M. A.; Thompson, M. J. (2021): Patent Management, Protecting Intellectual Property and Innovation, Springer: Cham, SUI, 264 S.

Gassmann, O.; Frankenberger, K.; Choudury, M. (2020): The Business Model Navigator, (2nd ed.) FT Publishing Pearson: Harlow, UK, 424 S.

Grichnik, D., Hess, M., Probst, D., Antretter, T., & Pukall, B. (2020): Startup Navigator – Guiding Your Entrepreneurial Journey. London: Red Globe Press

Books Chapters

Grichnik, D. & Hess, M. (2020). The St.Galler Navigator as a Governance Tool. In M. Hilb (Hg.), Governance of ventures: The role of venture boards, entrepreneurs and investors in entrepreneurial value creation (S. 24–35). Bern: Haupt.

Conference contributions

Blum, C., Budde, L., & Friedli, T. (2019). Stage-gate or perfectly agile – The future of smart service innovation: A systematic literature review. 10th International Research Symposium in Service Management (IRSSM-10), 07-09 October, 2019, Dubai, UAE.

Boateng, G., Lüscher, J., Scholz, U., Kowatsch, T. (2020): Emotion Capture among Real Couples in Everyday Life. Paper presented at the 1st Momentary Emotion Elicitation & Capture (MEEC) workshop, co-located with the ACM CHI Conference on Human Factors in Computing Systems, Honolulu, Hawaii, USA, April 25th, 2020.

Boateng, G., Sels, L., Kuppens, P., Lüscher, J., Scholz, U., Kowatsch, T. (2020): Emotion Elicitation and Capture among Real Couples in the Lab, Paper presented at the 1st Momentary Emotion Elicitation & Capture (MEEC) workshop, co-located with the ACM CHI Conference on Human Factors in Computing Systems, Honolulu, Hawaii, USA, April 25th, 2020.

Chanson, M., Martens, N., Wortmann, F. (2020): The Role of User-generated Content in Blockchain-based Decentralized Finance. Twenty-Eighth European Conference on Information Systems (ECIS2020) – A Virtual AIS Conference.

Eich, S., Friedli, T. (2020). Analysis of the effects of Operational Excellence implementation on Inspection Outcomes in the Pharmaceutical Industry: An Empirical Study. Brazilian Journal of Operations & Production Management

Eich, S., Grothkopp, M, Macuvele, J., Friedli, T. (2020). Progress of Operational Excellence implementation and performance in pharmaceutical manufacturing sites – descriptive study from 2003 to 2018. European Operations Management Association Conference.

Fuchs, K., Haldimann, M., Zeltner, M., Ilic, I. (2020): Icon-based Digital Food Allergen Labels for Complementation of Text-based Declaration. Twenty-Eighth European Conference on Information Systems (ECIS2020) – A Virtual AIS Conference.

Hess, M., Sirén, C., Wincent, J., & Grichnik, D. (2020): Dispersion Of Entrepreneurs' Power And Venture Performance After Initial VC Investment. In: 80th annual meeting of the Academy of Management (AOM), Vancouver (Canada).

Knapp, J., Lamprecht, C., Gebauer, H., Wortmann, F. (2020): From Selling Assets to Delivering Equipment-as-a-Service. Proceedings of the Spring Servitization Conference, SSC2020 Birmingham, UK. Virtual Event.

Koch, K., Liu, S., Berger, T., Wortmann, F. (2020): Towards the Healing Car: Investigating the Potential of Psychotherapeutic In-vehicle Interventions. Twenty-Eighth European Conference on Information Systems (ECIS2020), A Virtual AIS Conference.

Macuvele, J., Januszek, S., Friedli, T., Netland, T. (2020). «The Role of Management Control Practices for Operational Excellence in the Pharmaceutical Industry». European Operations Management Association Conference.

Maritsch, M., Föll, S., Lehmann, V., Bérubé, C., Kraus, M., Feuerriegel, S., KowalTtsch, T., Züger, T., Stettler, C., Fleisch, E., Wortmann, F. (2020): Towards Wearable-based Hypoglycemia Detection and Warning in Diabetes. CHI 2020, April 25–30, 2020, Honolulu, HI, USA.

Marty, M., Sun, Y., Fuchs, K., Rajasekaran, P. (2020): A Low-cost Approach Towards Streaming 3D Videos of Large-scale Sport Events to Mixed Reality Headsets in Real-time. 2020 IEEE Conference on Virtual Reality and 3D User Interfaces Abstracts and Workshops (VRW).

Ollier, J., Kowatsch, T. (2020): The Doctor Will See Yourself Now: Review and Discussion of a Mass-market Self-service Technology for Medical Advice. Proceedings of the 13th International Joint Conference on Biomedical Engineering Systems and Technologies (BIOSTEC 2020) – Volume 5: HEALTHINF, pages 798-807.

Sirén, C., He, F., Wesemann, H., Jonassen, Z., Grichnik, D., & von Krogh, G. (2020): The Impact of Emotion Regulation and Team Emotions on Leader Emergence in Nascent Venture Teams. In: 80th annual meeting of the Academy of Management (AOM), Vancouver (Canada).

Rassouli, F., Tinschert, P., Barata, F., Steurer-Stey, C., Fleisch, E., Puhan, M., Baty, F., Kowatsch, T., Brutsche, M. (2020): Characteristics of asthma-related nocturnal cough – a potential new digital biomarker. European Respiratory Society International Congress (ERS 2020) (virtual), Barcelona, Spain, September 7-9, 2020. Due to the Corona virus (COVID-19) the conference was conducted virtually

Teepe, G., Kowatsch, T. (2020): Swiss Francs Seem to Make Insured Move: Comparing Daily and Monthly Financial Incentives of a Scalable Digital Health Intervention. n Proceedings of the 13th International Joint Conference on Biomedical Engineering Systems and Technologies (BIOSTEC 2020) - Volume 5: HEALTHINF, pages 827-833, ISBN: 978-989-758-398-8.

Tinschert, P., Rassouli, F., Barata, F., Steurer-Stey, C., Fleisch, E., Puhan, M., Baty, F., Kowatsch, T., Brutsche, M. (2020): Nocturnal cough and sleep quality to assess asthma control and predict attacks. European Respiratory Society International Congress (ERS 2020) (virtual), Barcelona, Spain, September 7-9, 2020. Due to the Corona virus (COVID-19) the conference was conducted virtually.

Contributions in practical journals

Friedli, T., Elbe, C., Remling, D., & Deitermann, F. (2020). Produktion in der Schweiz lohnt sich. Die Volkswirtschaft: Plattform für Wirtschaftspolitik, 93(4), 45-46.

Grothkopp, M. (2020). 15 years of St.Gallen OPEX benchmarking. A success story. TechnoPharm, 10(5)

Grichnik, D., Knape, D. & Hess, M. (2020): Amazon Watch Dominance Index, Deep Dive Amazon Business. In: digital kompakt (Ed.): E-Commerce Germany Report. Marktreport für Amazon & Co. 2020, Berlin.

Grichnik, D. (2020): Die Veränderungsbereitschaft hat sich massiv erhöht (Interview). In: «What next» Content Hub der Deutschen Bank (digital).

Grichnik, D. (2020): Coronavirus aus der Weltraumperspektive. In: HSG Medienmitteilung.

Grichnik, D. & Hess, M. (2020). Startup Navigator with Prof. Dr. Dietmar Grichnik und Assistant Prof. Dr. Manuel Hess. (Video). In: YouTube.

Grichnik, D. (2020): Innovation wird immer ein Stück weit diffus bleiben (Interview). In: Liechtensteiner Vaterland/Wirtschaft Regional.

Grichnik, D. (2020): Viele Startups sind aktuell in der Red Zone (Interview). In: HSG Focus04.

Grichnik, D. (2020): Mensch vs. Maschine bei Startup-Investments. (Video). In: HSG Medienmitteilung

Grichnik, D. (2020): Künstliche Intelligenz (KI) vs. Bauchgefühl (Interview). In: Radio SRF4 Hofer, S., Fricker, L., Schmidt, B., Burkhard, B., Brahme, H., Grichnik, D., Bonaccio, S., & Kraak, M. (2020): The Performance of Spin-Off Companies at the Swiss Ferderal Institute of Technology Zurich, ETH transfer, ETH Zurich.

Lanza, G., Schuh, G., Friedli, T., Verhaelen, B., Rodemann, N., & Remling, D. (2020). Master the Transformation of Global Production. ZWF Zeitschrift für wirtschaftlichen Fabrikbetrieb.

Remling, D., Elbe, C., Deitermann, F., & Friedli, T. (2020). Werkplatz Schweiz und Digitaliserung: Von der Einsicht zur Auswirkung. Technische Rundschau Das Schweizer Industriemagazin, 112, 6-9.

Ritz, M., Friedli, T. (2020). A Global Initiative to Baseline Pharmaceutical Quality Management. St. Gallen Seeks OpEx Info from Industry. PDA Letter.

Schmidt, M., Maier, J. T., Grothkopp, M. (2020). Eine bibliometrische Analyse. Produktionsplanung und -steuerung und maschinelles Lernen. wt Werkstattstechnik, 110(4)0.

Thier, C.; Petric, T.; Gassmann, O.; Stepic, A. (2020): Boosting the innovation banking business models; white paper by Microsoft, 1-32.

Refereed journals

Ableitner, L., Tiefenbeck, V., Meeuw, A., Woerner, A., Fleisch, E., Wortmann, F. (2020): User behavior in a real-world peer-to-peer electricity market. Elsevier, Applied Energy 270 (2020) 115061.

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Bömelburg, R.; Zimmermann, A.; Palmié, M. (2020): Learning Paradox: A Mediation Model of Paradox Mindset Development. 2020. - EGOS 2020 Colloquium. Virtual.

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Fuchs, K., Ilic, A. (2020): Year in Review 2020, Auto-ID Labs ETH/HSG.

3.4 TALKS

Prof. Dr. E. Fleisch					
NZZ Podium Deutschland, Literaturhaus Stuttgart, 23.10.2020					
The Digital Pill, Inspiration-Session, OnlineDoctor, 19.11.2020					
Prof. Dr. Th. Friedli					
Operational Excellence 2020, Operational Excellence & Quality Metrics Conference 2020, Focas Research Institute in Dublin, Ireland, 27.01.2020					
How to measure Operational Excellence?, Operational Excellence & Quality Metrics Complimentary Evening Event, Focas Research Institute in Dublin, Ireland, 27.01.2020					
Offset für die Schweiz: Sinn oder Unsinn, Gesprächskreis Sicherheitspolitik, Bern, Switzerland, 10.03.2020					
Working with Metrics, FDA/Xavier PharmaLink Risk, Metrics and Culture Workshop, Xavier University Cincinnati, USA, Virtual Remote Presentation (Corona/Covid19 virus), 17.03.2020					
Using Data to Improve Business – Insights from 15 Years of Research: Integrated Risk Assessment and Business Intelligence to Improve Culture and Predictive Capabilities, FDA/Xavier PharmaLink Risk, Metrics and Culture Workshop, Xavier University Cincinnati, USA, Virtual Remote Presentation (Corona/Covid19 virus), 18.03.2020					
Einführung globale Produktionsnetzwerke, Kick-Off CAS in Produktionsmanagement FS2020-2021, HSG St. Gallen, Switzerland, Virtual Remote Presentation (Corona/Covid19 virus), 01.04.2020					
Research Update, QC Lab OPEX Exchange Platform Meeting 2, HSG St. Gallen, Switzerland, Virtual Remote Presentation (Corona/Covid19 virus), 02.09.2020					
OPEX in Pharma: From Innocence to World Leading, PDA/St.Gallen OPEX Anniversary Conference, Switzerland/USA, (Corona/Covid19 virus), 17.09.2020					
Steuerung dynamischer Produktionsnetzwerke, 3. Expertenforum Globale Produktion Stuttgart, Germany, Virtual Remote Presentation (Corona/Covid19 virus), 28.09.2020					
Tagungseröffnung und Produktionssysteme 2020+, St. Galler Produktionsmanagement-Tagung, Einstein St. Gallen, Switzerland, 20.10.2020					
Von Henry Ford zum Produktionsnetzwerk 2020+, St. Galler Produktionsmanagement-Tagung, Einstein St. Gallen, Switzerland, 21.10.2020					

Quality System Maturity from a Data Perspective, ISPE Annual Meeting, Virtual Remote Presentation, 02.11.2020 Developing scientifically an Assessment for a Global Quality Study, ISPE Annual Meeting, Virtual Remote Presentation, 04.11.2020 OPEX in Pharma: From Innocence to World Leading, St. Gallen OPEX Anniversary Conference, Virtual Remote Presentation, 25.11.2020 Strategic Management of Global Production Networks, Benchmarking Abschlusskonferenz, Virtual Remote Presentation, 30.11.2020 Strategisches Management globaler Produktionsnetzwerke, Gastvortrag in Vorlesung am WBK, Universität Karsruhe, Virtual Remote Presentation, 30.11.2020 Prof. Dr. O. Gassmann Innovation and technology management in a global family company, Liebherr, Colmar, 15.01.2020 Homeoffice – trotzdem produktiv?! HSG Webinar zur Coronakrise, 26.3.2020 «Geschäftsmodelle anpassen: Fit für Post-Corona?» Webinar ES-HSG, 05.05.2020 Adapting business models: Ready for Post-COVID19? Webinar BMI Lab, 13.5.2020 How to stimulate business model innovation for SMEs? Inter-Ireland Talk, Cork, 02.6.2020 **COVID-19 – How does is change the world and innovation?** Keynote ISPIM conference, 08.06.2020 Business Model Innovation: Concept and Philosophy, Virtual Workshop, 16.06.2020 Digitale Geschäftsmodelle mit dem Business Model Navigator, ZIA Immobilienwirtschaft Arbeitskreis, 30.07.2020 The «Why» and «How» of Business Model Innovation, Huawei, STC, 30.07.2020 Smart City – Von der Utopie zur Realität, Swiss Smart Governance Day, 08.09.2020 Zukunftsfähigkeit gestalten, HSG Highlights 2020, 8.-10.09.2020 **Strategiespiel mit Overlapping Technologies,** Zuger Innovationstag, 16.09.2020

Business Model Design – from Luck to Craftwork, Business Model Conference Copenhagen, 22.10.2020

Business Model Innovation: Wie kann ich Industrien revolutionieren? Youngpreneurs, Virtuelle Session & Coaching Gymnasien, 28.10.2020

AI based Business Models, Artificial Intelligence for Executives, 17.11.2020

AI powered Business Models: From correlation to causality, BMI Lab Think Tank, 20.11.2020

Prof. Dr. D. Grichnik

Frankfurt Digital Finance Conference, Frankfurt, Vortrag, Februar 2020

Akademiker-Mittwochslunch mit Studierenden der HSG, St. Gallen, Vortrag, März 2020

HSG Insights: Management- und Führungstipps in der Corona-Krise «Wie Unternehmen auf das Coronavirus reagieren können», Podcast, April 2020

HSG Insights: Management- und Führungstipps in der Corona-Krise «Überwachung der Covid-19-Krise aus dem Weltraum, Podcast, April 2020

HSG Insights: St.Galler Startup Navigator Lab, 3 Webinare mit Dr. Manuel Hess, Mai 2020:

- » «Erfolgreich aus der Krise starten war wir von Startups lernen können»
- » «Finanzierung und Operations sind auch in der Krise Architektur nicht Kunst was wir von Startups lernen können»
- » «Stresstest Wie sich Corporate Venture Capital in Zeiten von Unsicherheiten behauptet»

Wirksame Führung und Aufsicht von Startups; «Der Startup-Navigator auf VR-Ebene – als Governance-Tool», Swiss Board School, Zoom-Vortrag, Juni 2020

HSG Alumni Webinar-Woche:

Wie KMUs und Corporates von Startups in der Krise lernen, Juni 2020

HSG Gründer des Jahres, Julian Teicke, St. Gallen, Laudatio, September 2020

HSG Insights: Die neue Normalität erfolgreich gestalten, Webinar, September 2020 Krisenzeiten sind Unternehmerzeiten – Wecke in Dir die Lebensgeister des Innovierens und Experimentierens!

HSG und Fraunhofer Alumni FoodTech-Vortrag, Trends und Investments im FoodTech Startup Ecosystem, Oktober 2020

MacMillan International Higher Education, Startup Navigator Webinar mit Dr. Manuel Hess, Oktober 2020

Prof. Dr. J. Wincent

48 | 49 Appendix

Publishing in entrepreneurship theory & Practice, ESU Conference, Finland, 9.9.2020

Prof. Dr. Ch. Sirén

The Role of Emotions in Nascent Venture Teams, Research Seminar, University of Queensland (2020), Australia, 3.10.2020.

3.5 PERMANENT TASKS

Prof. Dr. E. Fleisch » Member of the Habilitation Committee of the HSG » Member of Senate and Department SoM HSG » Member of the Executive Committee of the Institute of Business Administration IfB-HSG (until June 2020) » Member of the Executive Committee of the Research Centre for Retail Management IRM-HSG » Member of the Executive Committee of the Institute for Computer Science ICS-HSG » Member of the steering committee (without voting rights) of the Bosch IoTS Lab » Member of the steering committee (without voting rights) of the Mobiliar Analytics Lab » Co-Chair of the Center for Digital Health Interventions at ITEM-HSG » Co-Chair of the CSS Health Lab at HSG and ETH Zurich » Founder and Director of the Auto-ID Lab at ETH & HSG (until 30.09.2020) » Co-Chair ETH/HSG Bits to Energy Lab » Member of the Swiss Academy of Engineering Sciences » Member of various academic associations » Member of the Gebert Rüf Foundation Board » Reviewer and programme committee member in various scientific disciplines journals and conferences Prof. Dr. Th. Friedli » Board Member of the Schuh & Co. Komplexitätsmanagement AG » Associate Member of the International Academy for Quality » Lecturer EMBA Program «Process & Excellence Management» and Scientific Council Member

at iimt, University of Fribourg

»	Lecturer EMBA at the University of Salzburg, Process- and Quality Management
»	Board Member of the FUTUR Foundation
»	Advisory Board Member at SQS – Schweizerische Vereinigung für Qualitäts- und Managementsysteme
»	Responsible for the Military Liaison Office at the University of St. Gallen
»	President of the jury, REHAU-Wirtschaftspreis
»	Member of the Research Advisory Board at the Complexity Management Academy, Aachen
P	rof. Dr. O. Gassmann
»	Director of the Global Center for Entrepreneurship and Innovation (GCEI-HSG)
»	Co-founder and Director of Center for Innovation (CfI-HSG)
»	Co-founder and Director of the Center for Energy Innovation, Governance and Investment (EGI-HSG)
»	Co-founder and Director of Center for Mobility (CfM-HSG)
»	Faculty Member of Senate and School of Management HSG
»	Member of the Executive Board for Executive Education of the University of St. Gallen
»	Member of the Executive Committee at Institute of Marketing (IfM-HSG)
»	Member of the Executive Committee at Center for Customer Insight (ICI-HSG)
»	Member of the Executive Committee at Center for Mobility (CFM-HSG)
»	Member of the Steering Committee Bosch IoT Lab
»	GLORAD-Research Center, Shanghai-St. Gallen
»	Member of the board of the Swiss Federal Institute of Intellectual Property
»	Member of International Advisory Board, Alexander von Humboldt Institute (Berlin)
»	Member of the board (Hoffmann Neopac, Weidmann, Zühlke)

» Intern	national Advisory Board of California Management Review
» Edito	rial Board of R&D Management; Creativity and Innovation Management; IJEIM
Prof. Dr	. D. Grichnik
	ounder and Co-Director des Global Center for Entrepreneurship and Innovation der (GCEI - HSG)
» Direc	tor of the Center for Entrepreneurship (CfE-HSG)
Mem	per of the School of Management (SoM)
Mem Comi	per of the Senate and Representative of the School of Management in the Senate nittee
Vicar	ous member of the «Kommission Nebenbeschäftigung der HSG»
	lent of the Executive Committee of the Institute for Media and Communications gement, MCM-HSG
	per of the Executive Committee of the Institute of Business Education and ational Management, IWP-HSG
Mem	per of the Executive Committee of the Institute for Computer Science, ICS-HSG
Mem	per of the Advisory Board of the Swiss Startup Factory
Board	Member CCVS – Center for Corporate Venturing Switzerland
Mem	per of the Swiss Institute of Directors
Manc	ates in diverse Associations, Organizations und Initiatives
Keyn	ote Speaker in the Executive MBA-Program at the HSG
Keyn	ote Speaker in the International Executive MBA-Program at the HSG
	oer of the Editorial Board of the JBV – Journal of Business Venturing, preneurship Theory and Practice
	ent of the Jury «HSG Gründer des Jahres», «HSG Entrepreneurial Talents» and Entrepreneurial Champions»

- Member of the Jury for the Award «Digital Champion Award»
 der WirtschaftsWoche/Handelsblatt
 Member of the Jury for the Award «Startfeld Diamand» of St. Galler Kantonalbank
 Experts at diverse Research Institutes, Funding Institutions and University
 Prof. Dr. J. Wincent
 Professor of Entrepreneurship and Management, Hanken School of Economics, Finland
- » Regular reviewer for management journals such as the Academy of Management Journal, Journal of Management Studies
- » Current member of editorial review board of Journal of Business Venturing
- » Action Editor of the academic journal Entrepreneurship: Theory and Practice

Prof. Dr. V. Souitaris

- » Professor of Entrepreneurship and Subject Leader (part time appointment), Cass Business School, City University of London
- » Field (Associate) Editor for the Journal of Business Venturing, the lead international journal in Entrepreneurship
- » Regular reviewer for the Academy of Management Journal, Strategic Management Journal, Journal of Business Venturing and Organization Science
- » Current member of editorial review board of Journal of Management Studies and Entrepreneurship Theory and Practice
- » Visiting professor at International Hellenic University, Thessaloniki, Greece

Prof. Dr. Ch. Sirén

» Regular reviewer for journals such as the Journal of Management Studies, Entrepreneurship Theory & Practice, and Journal of Business Venturing

3.6 PROMOTIONS

Spring 2020

Dr. Bernhard Gahr

Towards the Personalized Car – Investigating Driver Identification using CAN Bus Data; Prof. Dr. Elgar Fleisch, Prof. Dr. Andreas Herrmann

Dr. Arne Meeuw

Design, Implementation, and Evaluation of a Blockchain-based Microgrid Platform – Enabling Local Peer-to-Peer Energy Markets; Prof. Dr. Elgar Fleisch, Prof. Dr. Rolf Wüstenhagen

Dr. Jan-Niklas Kramer

Public Health Impact of Scalable Physical Activity Interventions: Insights from Two Field Studies in Switzerland; Prof. Dr. Elgar Fleisch, Prof. Dr. Urte Scholz

Dr. Stefanie Turber

How technology affords organizing value creation in the digital era: The evolution of thriving business models in nascent IoT categories; Prof. Dr. Oliver Gassmann, Prof. Dr. Jan vom Brocke

Dr. Jonas Böhm

Exploring the phenomenon of innovating value co-creation mechanisms – An empirical study in the electrical power sector; Prof. Dr. Oliver Gassmann, Prof. Dr. Rolf Wüstenhagen

Dr. Torben Antretter

Investment Decisions and Outcomes of Early Stage Investors;

Prof. Dr. Dietmar Grichnik, Prof. Dr. Elgar Fleisch

Dr. Henrik Wesemann

Is There No «I» in Team? Team Formation, decisions, and outcomes und individual differences; Prof. Dr. Dietmar Grichnik, Prof. Dr. Thomas Zellweger

Dr. Michael Wiech

Coordination of Inter-Plant Exchange – Make Plant Leaders Part of the Solution; Prof. Dr. Thomas Friedli, Prof. Dr. Klaus Möller

Dr. Paul Bueß

Enabling Manufacturing Companies to Implement Data-based Applications to Support Lean Practices; Prof. Dr. Thomas Friedli, Prof. Dr. Kuno Schedler

Dr. Philipp Osterrieder

The organizational integration of data-based service activities at manufacturing companies; Prof. Dr. Thomas Friedli, Prof. Dr. Elgar Fleisch

Dr. Lorenz Stähle

Enabling digital service innovation in medical technology firms: An organizational capability perspective; Prof. Dr. Thomas Friedli, Prof. Dr. Elgar Fleisch

Autumn 2020

Dr. Peter Tinschert

Enabling Digital Medicine for Asthma – Clinical Utility of Nocturnal Cough and Sleep Quality as Digital Biomarkers; Prof. Dr. Elgar Fleisch, Prof. Dr. Dr. Martin Brutsche

Dr. Chen-Hsuan Iris Shih

Smartphone-Based Acoustic Breathing Patterns Detection for a Biofeedback Guided Breathing Training; Prof. Dr. Elgar Fleisch, Prof. Dr. med. Dagmar l'Allemand, Prof. Dr. Tobias Kowatsch

Dr. Vitor Filipe Da Conceição Barata

Enabling A Digital Biomarker for Asthma - Smartphone Contact-Free Audio-Based Nocturnal Cough Monitoring; Prof. Dr. Elgar Fleisch, Prof. Dr. David Frederick Kotz, Prof. Dr. Tobias Kowatsch

Dr. Mathieu Chanson

Towards the Economy of Things: Insights from the Convergence of Blockchain Technology and the Internet of Things; Prof. Dr. Elgar Fleisch, Prof. Dr. Frédéric Thiesse, Prof. Dr. Felix Wortmann

Dr. Anselma Meret Wörner

Fostering Sustainability Using Information Technology: Real-Time Feedback, Incentives, and Smart Markets; Prof. Dr. Elgar Fleisch, Prof. Dr. Wolfgang Ketter, Prof. Dr. Verena Tiefenbeck

Dr. Klaus Fuchs

Empowering Diet-related Health Behavior Change Interventions via Digital Receipts & Food Composition Databases; Prof. Dr. Elgar Fleisch, Prof. Dr. Simon Mayer, Dr. Alexander Ilic (PD)

Dr. Florian Andreas Künzler

Are you Receptive? Assessing and Predicting States of Receptivity for Physical Activity Interventions; Prof. Dr. Elgar Fleisch, Prof. Dr. David Frederick Kotz, Prof. Dr. Tobias Kowatsch

Dr. Raquel Rosés

Exploring Theory-Informed, Data-Driven Simulations for Predicting Crime; Prof. Dr. Elgar Fleisch, Prof. Dr. Nick Malleson, Prof. Dr. Verena Tiefenbeck

Dr. Raphael Bömelburg

Promise of tomorrow, profits of today: Towards a microfoundations perspective of ambidexterity; Prof. Dr. Oliver Gassmann, Prof. Dr. Alexander Zimmermann

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