



2023 ICPR27

27th International Conference on Production Research
Cluj-Napoca, Romania, 23-28 July 2023

27th International Conference on Production Research

organized by the

International Foundation for Production Research

and hosted by the

Technical University of Cluj-Napoca

under the theme

"Building resilience into production"

The mission of **The International Foundation for Production Research** is to encourage communication among researchers of production systems and processes around the world, especially by its continuing support of the **International Conference on Production Research**. This edition addresses the following topics:

- Post-pandemic Recovery of Industry and Production
- Strategies and Approaches to Develop Production Resilience
- Regional Economic Integration and Its Impact on Manufacturing Trends
- Digital and Cyber Manufacturing and Services for Industry 4.0 & 5.0
- Internet of Things, Data Analytics and Smart Manufacturing
- Industrial Communication and Automation
- Manufacturing Processes and Automation
- Manufacturing Systems and Supply Chains
- Industrial Engineering and Operations Research
- Human Factors Engineering
- Sustainable Production and Climate-Smart Production
- Logistics Engineering and Management
- Smart City and Digital Transformation
- Quality Engineering and Management
- New Product Development and Innovation Management
- Robotics and Artificial Intelligence in Production
- Virtual and Augmented Reality in Production



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OVERVIEW PROGRAM

21 July 2023	22 July 2023	23 July 2023	Time →	24 July 2023	25 July 2023	26 July 2023	27 July 2023	28 July 2023
Friday	Saturday	Sunday		Monday	Tuesday	Wednesday	Thursday	Friday
Doctoral Workshop (click for detailed schedule) Early Career Researchers Workshop (click for detailed schedule)			09.00-10.30	Opening Ceremony Keynote presentations	Keynote presentations	Workshop "Increasing Resilience by Product & System Innovation Management" Technical Sessions	Workshop/Tracks "Quality and Innovation in Engineering and Management" 7 th Edition	Social tours (click to register)
			10.30-11.00	Coffee break	Coffee break	Coffee break	Coffee break	Social tours
			11.00-12.30	Industry Leaders Panel	IFPR Women Forum	Technical Sessions	Closing ceremony	Social tours
			12.30-14.00	Lunch break	Lunch break	Lunch break	Technical tours Social tours	Social tours
			14.00-15.30	Technical Sessions	Technical Sessions	Technical Sessions	Technical tours Social tours	
			15.30-16.00	Coffee break	Coffee break	Coffee break	Technical tours Social tours	
	IFPR Executive Board (by invitation, schedule sent directly)	IFPR Board (by invitation, schedule sent directly)	16.00-17.30 (18.00)	Workshop "Semantic data interoperability and integration for resilient manufact." Technical Sessions	Workshop "Research paving the way for the new Industry 5.0" Technical Sessions	Technical Sessions	Technical tours Social tours (click to register)	
	Welcome Reception		19.00-22.00	Dinner	Gala Dinner	Dinner		
Breaks - in rooms, Reception - foyer			Time →	Coffee breaks - near session rooms, Lunches - Firenze Restaurant, Dinners - Venezia Restaurant				

Monday, 24.07.2023
Opening ceremony & Keynote Presentation
9⁰⁰-10³⁰, Room Vivaldi+Verdi

Welcoming addresses

Bogdan-Gruia Ivan, Minister of Research, Innovation and Digitalization




Emil Boc, Mayor of the city of Cluj-Napoca

Vasile Ţopa, Rector of the Technical University of Cluj-Napoca

Luis Quezada, President of the International Foundation for Production Research

Daniela Popescu, President of the ICPR 2023 Organizing Committee

Keynote presentations

27 ICPR 2023 Speaker	Affiliation	Presentation title
	<u>Chen-Fu Chien</u> National Tsing Hua University, Taiwan	Modeling and analysis to empower digital decisions for smart semiconductor manufacturing
	<u>Bopaya Bidanda</u> University of Pittsburgh, United States of America	Building Resilience and Advancing Production & Industrial Engineering Education & Research
	<u>Rob Dekkers</u> University of Glasgow, United Kingdom	Why 'Business and Management Studies' do not get 'Design and Engineering'?




Monday, 24.07.2023
Industry Leaders Panel
11⁰⁰-12³⁰, Room Vivaldi+Verdi

Hüseyin Özmeral, Senior Vice-President, Plant manager [Bosch Cluj Plant](#)

Voicu Oprean, CEO and founder, [AROBS Transilvania Software](#)

Tuesday, 25.07.2023
Keynote Presentation
9⁰⁰-10³⁰, Room Vivaldi+Verdi

Keynote presentations

27 ICPR 2023 Speaker	Affiliation	Presentation title
	<u>Daria Battini</u> University of Padova, Italy	Human digital twins for resilient manufacturing systems: insights from the MICS Italian project
	<u>Mathias Liewald</u> & <u>Kim Riedmüller</u> University of Stuttgart, Germany	Upcoming legislative regulations in the EU regarding sustainability in production
	<u>Ilkyeong Moon</u> Seoul National University, South Korea	Korean manufacturing practices

Tuesday, 25.07.2023
IFPR Women Forum
11⁰⁰-12³⁰, Room Vivaldi+Verdi

Monica Constantinescu, Plant Commercial Manager, [Bosch Cluj Plant](#)
Sigal Berman, Professor at [Ben-Gurion University of the Negev, Israel](#)
Daniela Popescu, Professor at the [Technical University of Cluj-Napoca](#)
Alina Negru, General Manager [Emerson SRL Cluj](#)
Maria Metz, CEO at [NTT DATA Romania](#)
Florentina Marinela Ionaşcu, Education Director at [Microsoft Romania](#)

Moderator: Oana Buzatu, Cluj-Napoca City Hall, C-EDU Cluster

Rapporteur: Aurelia Ciupe, Technical University of Cluj-Napoca, Women in Tech Initiative

TRACK 1 - PRODUCTION SYSTEMS RESILIENCE

Session 1.1	Monday, 24.07.2023 14 ⁰⁰ - 15 ³⁰ hrs	Chairs: Luis Quezada, Boaz Golany Vivaldi Room
1418	Benjamin Schneider, Josip Zilic, Raul Ghedeon Matei, Stefan Giosan, Carmen Constantinescu and Mehmet Kürümlüoğlu	Approach for Integration of Model-based Systems Engineering and Product Life Cycle Management
1893	Maury Melo, Sergio E. Gouvea da Costa, Edson Pinheiro de Lima and Fernando Deschamps	Using the Delphi technique to develop a Data Science model for the Construction Industry
2361	Rob Dekkers, Pauline Found and Yang Cheng	Unravelling Eight Myths for Publishing Literature Reviews in the Domains of Operations and Supply Chain Management
9695	Yonggon Jung and Jun-Geol Baek	GAF-Based Time Series Imaging Transformation Applying Angle of Intersections Matrix for Time Series Classification
2928	Takayuki Kataoka, Katsumi Morikawa and Katsuhiko Takahashi	Minimizing the number of operators with multi-skill levels in labor-intensive cells
627	Stefan Minner	Supply network design for resilient manufacturing systems

Session 1.2	Workshop 1 - Semantic data interoperability and integration for resilient manufacturing	
	Monday, 24.07.2023 16 ⁰⁰ - 18 ⁰⁰ hrs	Conveners: Dusan Sormaz, Arkopaul Sarkar Vivaldi Room
<i>Introduction</i>		
<i>Dusan Sormaz, Industrial Ontology Foundry (IOF) Overview and Status</i>		
1778	Arkopaul Sarkar, Milos Drobnjakovic, Sina Namaki Araghi, Mohamed Hedi Karray and Dusan Sormaz	Ontology Modeling of Plan and their Conformance to Manufacturing Execution
1051	Riad Al Hasan Abir, Mandvi Malik Fuloria, Dusan Sormaz, Peter Adjei, Felix Asare, David Koonce and Saruda Seeharit	Ontology Model for Mapping Terms and Relations in Plastic Manufacturing - A Case Study
6013	Arkopaul Sarkar, Zhengyu Liu, Sina Namaki Araghi, Bernard Archimede, Rebecca Arista and Mohamed Hedi Karray	Exploring models' interoperability in digital thread and twin: a proposal for an ontology-driven approach based on intra-and cross-organizational enterprise integration
3549	Manja Mai-Ly Pfaff, Tim Wunderlich, Ken Wenzel and Steffen Ihlenfeldt	Formalization the Expert Knowledge of Human-Bound and Individual Processes in Manufacturing
<i>Arkopaul Sarkar, Harmonisation of Industrial Data documentation - Horizon Eu OntoCommons Project</i>		
<i>Conclusions</i>		



Session 1.3	Tuesday, 25.07.2023 14⁰⁰ - 15³⁰hrs	Chairs: Dieter Spath, Zhou Qijun Vivaldi Room
1864	Joachim Lentes	Ontology-Based Engineering - an overview
2453	Martina Calzavara, Benedetta Baldi, Ivan Russo and Daria Battini	Towards quantitative metrics for supply chain and company resilience assessment
2888	Giovanni Francesco Massari, Raffaele Nacchiero and Ilaria Giannoccaro	How digital technologies improve supply chain resilience: The mediating role of supply chain transformative capability
4051	Yu-Ju Lin, Ting-Yi Weng, Ting-Kai Liang and Chin-Yin Huang	A Proposed Ontological OPC-UA in Semiconductor Cleanroom Monitoring System
5904	Ciro-Alberto Amaya and Melissa Pájaro	Comparative Analysis between different types of Seru Production System and Assembly Line
6148	Michele Martignago, Martina Calzavara, Niloofar Katiraei, Dmitry Ivanov and Daria Battini	Application of performance and network indicators in supply chain resilience

Session 1.4	Tuesday, 25.07.2023 16⁰⁰ - 18⁰⁰hrs	Chairs: Stefan Minner, Sergio Gouvea Da Costa Vivaldi Room
1071	Johannes Wimmer, Christian-Oswaldo Saba-Gayoso and Erdem Gelec	Smart and resilient manufacturing: Machine learning approach to identify patterns of employee skill levels for cognitive assistance within inspection processes
6826	Yu-Ju Lin, Chih-Chia Lai, Yu-Shuo Tseng and Chin-Yin Huang	Integration of Knowledge Reasoning and Deep Learning to Predict the Removal Rate of CMP in Semiconductor Manufacturing
7273	Felisa Córdova, Margareth Gutierrez and Cecilia Montt	The value of context in the construction of Storytelling for tacit knowledge management in complex organizations
7516	Paulina Golinska-Dawson, Tomohiko Sakao, Erik Sundin and Karolina Werner-Lewandowska	Challenges and research issues for remanufacturing in PAAS from theory to industry perspective
7628	Yuusaku Tahara, Yasutomo Nagai and Sumika Arima	Multi-factory scheduling for a corporated supply chain
3621	Keonwoo Park, Changseong Ko and Ilkyeong Moon	Dynamic Facility Location with Flexible Capacity in Vehicle-to-Vehicle Delivery and Crowdsourcing: A Deep Reinforcement Learning Approach

Session 1.5	Wednesday, 26.07.2023 9 ⁰⁰ - 10 ³⁰ hrs	Chairs: Takahashi Katsuhiko, Călin Neamțu Caravaggio Room
9630	Ran Shneur and Sigal Berman	Mapping robotic assembly planning documents: towards production planning automation
3172	Ying Yang	Supply chain strategy after the COVID-19 pandemic
3732	Christiaan de Goeij and Luca Gelsomino	Uncovering the Neglected Nexus: Exploring the Interplay between Resilience and Working Capital Strategies in Supply Chains
4747	Rob Dekkers and L. J. Lekkerkerk	Hidden in the Corner? A Systems Approach to the Z-diagram for Capturing Timeliness of Manufacturing
7456	Shohei Kanda, Keisuke Nagasawa, Katsumi Morikawa and Katsuhiko Takahashi	Configuration of machines and a multistep switching policy in dynamic hybrid MTS/MTO production systems.

Session 1.6	Wednesday, 26.07.2023 11 ⁰⁰ - 12 ³⁰ hrs	Chairs: Arik Sadeh, Emilia Brad Caravaggio Room
4839	Michael Hertwig	System dynamic modelling is supporting the urban production paradigm
5472	Qijun Zhou, Abdul Ali and Honglan Yu	Strategies for digital transformation in SMEs: the impact of timing and speed
5683	André Silva de Souza, Clarissa Figueredo Rocha, Fernando Deschamps, Sergio E. Gouvea da Costa and Edson Pinheiro de Lima	Impact of the digital twin on operations management: a systematic literature review
5777	Yu-Ju Lin, Tai-Yu Lu, Wei-Che Ko and Chin-Yin Huang	Introducing IoT in VSM to Realize Digital Lean Production
2681	Nicola Berti, Francesca Catalano, Alessandro Persona and Ilenia Zennaro	Manual order picking and robotic mobile fulfilment systems performance comparison

Session 1.7	Wednesday, 26.07.2023 14 ⁰⁰ - 15 ³⁰ hrs	Chairs: Michael Hertwig, Radu Comes Caravaggio Room
6370	Hyeon-Il Kim and Dong-Ho Lee	A two-phase branch and bound algorithm for three-machine flow shop scheduling with reworks under overlapped queue time limits
8301	Gang Ma and Charles Møller	Enhanced DDMRP Scheduling Model Incorporating Capacity Constraints and Machine Utilization for Large-scale Manufacturing System
9199	Feng Yu Hsieh, Yang Kuei Lin and Yi Chi Wang	Developing dispatching rules for flexible flowshop scheduling problem
2925	Katsunari Ikezawa, Atsuya Kawai, Shingo Akasaka and Jiahua Weng	Novel circular supply chain model considering the reuse of recovered parts in multiple products
2841	Yu-Ju Lin, Chi-Yuan Tseng, Chiao-Yueh Liu and Chin-Yin Huang	A Preliminary Study for Ontology-Based Controller in Factory Automation

Session 1.8	Wednesday, 26.07.2023 16 ⁰⁰ - 17 ³⁰ hrs	Chairs: Bogdan Mocan, Florin Popișter Caravaggio Room
6455	Hyeon-Il Kim, Ae-Jin Youn, Seung-Hyun Lee and Dong-Ho Lee	Variable neighborhood search algorithms for system-level configuration selection in reconfigurable single part flow lines
3211	Weiyuan Li, Ming K. Lim and James Wilson	The new disruption by COVID-19 to the automotive supply chain and recovery strategies
9485	Qian Huang and Ruixue Li	Building a More Resilient Supply Chain: Planning Production Allocation and Freight Rail Transportation in the Face of Disruptions
4322	Stefan Gerlach and Moritz Hämmerle	Patterns for Resilient Workforce Structures and Strategies in Manufacturing
420	Rafael A. Fayet, Edson Pinheiro de Lima, Fernando Deschamps and Sérgio Gouvea da Costa	Developing a Framework for value creation in the context of digital transformation

TRACK 2 - RESILIENT PROCESSES AND PRACTICES

Session 2.1	Monday, 24.07.2023 14 ⁰⁰ - 15 ³⁰ hrs	Chairs: Bopaya Bidanda, Devkumar Callychurn Verdi Room
5443	Deborah Gabriela Sarria Garcia, Anis Assad Neto, Alexandre Surkus-Castro and Fernando Deschamps	Production line measurements as predictors: towards geometric quality assurance for assembly
1506	Kim Hua Tan, Osamu Yoshie and Leanne Chung	The Unintended Consequences of Digitalisation on Supply Chain Relationships
1780	Moe Endo and Harumi Haraguchi	A Study on On-the-Job Training (OJT) operator allocation considering fatigue in cell manufacturing system
3801	Marijana Palalić, Fabian Bieg, Clemens Maucher, Kamil Güzel and Hans-Christian Möhring	Intelligent additive-subtractive manufacturing for resilient production
6521	Frederik Weber and Shimon Nof	Increasing resilience by quantifying the value of collaborative negotiations
7071	Yunseon Byun and Jun-Geol Baek	Unsupervised Anomaly Detection considering Angle-wise Relational Function in Latent Space of Time Series Data

Session 2.2	Monday, 24.07.2023 16 ⁰⁰ - 17 ³⁰ hrs	Chairs: Wilhelm Bauer, Olga Battaia Verdi Room
3803	Stefan Bodi, Amina Vildanova, Zsolt Levente Buna, Calin Neamtu, Radu Comes, Daniela Popescu and Raul-Silviu Rozsos	A novel method for increasing the accuracy of the WAAM process technology
5252	Kyung Jun Min, Byung Do Chung and Gyusung Cho	A hybrid multi-agent system for analysis of efficiency in collaborative human-robot order picking systems
5489	Alexandre Surkus-Castro, Fernando Deschamps, Edson Pinheiro De Lima, Deborah Gabriela Sarria Garcia, Anis Assad Neto and Sergio E Gouvea da Costa	The Data Journey: Proposal of Formal Representation of Mapping and Characterizing Data Agents, Assets and States from Data Generation to Data Serving in a Data-Centered Operating Environment
7710	Benjamin Wingert, Jan Hofmann, Matthias Bues and Oliver Riedel	Co-located collaborative Virtual Reality to accelerate the engineering process
8523	Zhaohui Geng, Bopaya Bidanda and Sachithra Karunathilake	Reverse Engineering: The Other Side of Additive Manufacturing

Session 2.3	Tuesday, 25.07.2023 14 ⁰⁰ - 15 ³⁰ hrs	Chairs: Moon Ilkyeong, Carmen Constantinescu Verdi Room
4931	Yong Jae Kim and Byung Soo Kim	Order and rack scheduling problem with multiple workstations and rack reassignment in the robotic mobile fulfillment system
698	Himmet Kulavuz, Ali Burak Tekyalcin, Ismail Bogrekci and Pinar Demircioglu	Industrial Usage of Cold Rolled Materials in the Rollforming Process
9607	Min Guo, Hing Kai Chan, Xiang T. R. Kong and Dimple R. Thadani	Incentivising-sharing-enabled Placement Strategy on a Reusable Transport Item Sharing Platform
1247	Xinbing Gu, Hing Kai Chan, Dimple R. Thadani, Faith Ka Shun Chan and Yi Peng	Antecedents of supply chain resilience of logistics companies: an exploratory study
8088	Emilia Brad, Vladut Trifan, Dragos Bartos, Ionut Chis and Anca Stan	Enhancing CNC Milling Machine Operator Training with Augmented Reality Smart Glasses

Session 2.4	Workshop 2 - Research paving the way for the new Industry 5.0	
	Tuesday, 25.07.2023 16 ⁰⁰ - 18 ⁰⁰ hrs	Convener: Horvat Djerdj Verdi Room
<i>Introduction</i>		
<i>Horvat Djerdj, The link between Industry 4.0 and Industry 5.0</i>		
4478	Djerdj Horvat, Angela Jäger, Christian Lerch and Heidi Heimberger	Developing employees for smart human-machine collaboration in manufacturing: an Industry 5.0 perspective
288	Ottó Csiki and Levente Szász	A systematic literature review on the interplay between Industry 4.0 technologies and human resources
946	Juan Miguel Sepúlveda and Tamara Droguett	Integration of Industry 4.0 concepts into Lean Six Sigma projects: A case study in the ready-mixed concrete industry.
2320	Gonzalo Mejía, Francisco Yuraszcek and Daniel Rossit	Rescheduling with real time information and Industry 4.0 technologies for complex manufacturing systems
8951	Hendrik von Linde and Oliver Riedel	A methodology for intuitive use of AI-driven solutions in optimisation of manufacturing processes
<i>Horvat Djerdj, Hot topics in Industry 5.0</i>		
<i>Discussions about the future of Industry 5.0 research</i>		

Session 2.5	Wednesday, 26.07.2023 9 ⁰⁰ - 10 ³⁰ hrs	Chairs: Kim Riedmüller, Yuki Kinoshita Michelangelo Room
6746	Raul Matei, Stefan Giosan, Cristian Roiban and Carmen Constantinescu	Holistic Methodology for real-time optimization of holistic production through comprehensive and Cognitive Digital Twins
9323	Stefan Giosan, Carmen Constantinescu and Daniela Popescu	Cognitive Digital Twins: Approach, Development, and Prototyping in a Discrete Automotive Manufacturing Scenario
920	Raul Matei, Carmen Constantinescu and Daniela Popescu	Fully Automated Data Acquisition Methodology for Hybrid 3D Scanning Processes towards Cognitive Digital Twins
9995	Young-Suk Han and Jae-Yoon Jung	Three-stage data-driven approach to fast and accurate job dispatching using learning-to-rank techniques
954	Stefan Giosan, Mihaela Palca and Carmen Constantinescu	Artificial Intelligence-based ergonomic optimization of manufacturing workplaces through Real-Time Digital Twins
9382	Raul Matei, Andrei Fagaras, Carmen Constantinescu, Ralf Lossack, Dennis Nier, Alexander Stumm and Steffen Kappes	Continuously integrated product design, process, and production optimization. Motivation scenario and prototype: Modular and smart 3D-printed gripper for flexible pick-and-place processes

Session 2.6	Wednesday, 26.07.2023 11 ⁰⁰ - 12 ³⁰ hrs	Chairs: Juan Miguel Sepúlveda, Mihail Țițu Michelangelo Room
5847	Ryusei Toshima, Keisuke Nagasawa, Katsumi Morikawa and Katsuhiko Takahashi	An optimal configuration and operation model for hybrid MTS/MTO production systems with multiple products and multiple machines
1774	Thiago Kato, Mauricio Iwama Takano and Marcelo Seido Nagano	An upper bound for the branch-and-bound algorithm for the blocking permutation flow shop with total tardiness criterion
4168	Michał Fertsch	A method of description the production process for production planning and control purposes
6233	Daisuke Hirotani and Syunsuke Nakao	Profit maximization problem for closed loop supply chain with subsidy
2813	Daniela Popescu, Mihai Dragomir, Sorin Popescu, Calin Neamtu and Diana Dragomir	Production research in Romania: trends, needs and agenda

Session 2.7	Wednesday, 26.07.2023 14 ⁰⁰ - 15 ³⁰ hrs	Chairs: Manja Mai-Ly Pfaff, Cornel Ciupan Michelangelo Room
7053	Yong-Jun Im, Yeon-Soo Kim, Huyen Vu Thi Thu and Tai-Woo Chang	Process improvement and real-time defect inspection for statistical process control
7533	Mircea Fulea, Cosmin Ioanes, Bogdan Mocan and Mircea Murar	Open-sorce IIOT operating and control software application for a weld-and-polish robotic cell
9212	Ran Shneor and Yael Edan	Recent robotic research and development trends
3096	Zsolt Levente Buna, Daniela Popescu, Vlăduț Astaloș, Călin Neamțu, Radu Comes and Stefan Bodi	Augmented reality for knowledge transfer and digitalization of processes in industrial maintenance
8811	Marek Fertsch	A model for selecting the trajectory of the transformation of the production cell.

Session 2.8	Wednesday, 26.07.2023 16 ⁰⁰ - 17 ³⁰ hrs	Chairs: Jelena Borocki, Dan Hurgoiu Michelangelo Room
5645	Michal Adamczak, Adrianna Tobola-Walaszczyk, Piotr Cyplik and Maciej Torz	The impact of IoT tools on drivers' driving style and CO2 emissions
9418	Ana-Diana Pop-Suărășan and Nicolae Stelian Ungureanu	The implications imposed by prescriptive maintenance implementation into the Industry 4.0 - a current state analysis
9685	Benjamin Schneider, Stephan Schüle, Mehmet Kürümlüoğlu and Oliver Riedel	Assessment Framework for Advanced Systems Engineering
4505	Nikolas Zimmermann	Process analysis in dynamic production environments
9948	Radu Chiorean, Cristian Vilau, Mihaela Simion, Paul Bere, Calin Neamtu and Mircea Cristian Dudescu	Stiffness analysis of an electric car composite bumpers

TRACK 3 - SUSTAINABLE PRODUCTION

Session 3.1	Monday, 24.07.2023 14 ⁰⁰ - 15 ³⁰ hrs	Chairs: Anthony SF Chiu, Daria Battini Bernini Room
500	Rei Kinoshita, Shunichi Ohmori and Tomomi Kito	Simulation Analysis for the Promotion of Organic Cotton With the Aim of Solving Social Issues in the Clothing Supply Chain
820	Kai-Chao Yao, Hsi-Huang Hsieh, Ching-Hsin Wang and Kim Hua Tan	Research on Sustainable Management Strategy of Resource Rubber Recycling Industry
8493	Johan Vogt Duberg and Ou Tang	Leveraging customer usage data for optimal maintenance policies in product-as-a-service
157	Lianne Pimenta, Norma Beltrao and Renata Oliveira	Scoping review of multicriteria decision-making/analysis methods to assess urban quality of life
8298	Devkumar S Callychurn	Modeling the paradigm shift towards renewable energy sources in the Mauritian Textile & Apparel Industry using System Dynamics
4485	Marius Gal, Lucian Lobont and Claudiu Kifor	Knowledge capitalization in automotive research & development offshore branches

Session 3.2	Monday, 24.07.2023 16 ⁰⁰ - 18 ⁰⁰ hrs	Chairs: Pinheiro de Lima Edson, Cecilia Montt Bernini Room
3602	Michael Hertwig, Wolfgang Beinhauer, Daniel Borrmann, Pascal Westerbeck and Florian Herrmann	Strategic workforce prognosis in automotive R&D
8568	Andreea Ungureanu, Aurel Mihail Titu, Madalina Pana, Iuliana Moisescu and Madalina Nita	Carbon footprint calculation in different areas of activity depending on specific emission factors
9329	Francesco Pilati, Marco Giacomelli and Matteo Brunelli	Integrating lot-sizing environmental factors estimation for a green reorder-level inventory control policy
2241	Francesca Catalano, Nicola Berti, Ilenia Zennaro and Alessandro Persona	Comparing different workforce strategies In mixed model assembly systems
3575	Ali Keshvarparast, Daria Battini, Amir Pirayesh and Olga Battaia	Collaborative robotic assembly line balancing to increase workers productivity and safety
8666	Dana Fatol and Diana Robescu	Two worlds apart? Overcoming the discord in talent management between academia and business

Session 3-3	Tuesday, 25.07.2023 14 ⁰⁰ - 15 ³⁰ hrs	Chairs: Arkopaul Sarkar, Ciro Alberto Amaya Gui Bernini Room
5935	Kirsten Lange, Robert Refflinghaus, Anna Hupe and Ulrich Bretschneider	Establishing a comprehensive quality management for the use of crowd-based mechanisms by SMEs
3434	Katsumi Morikawa, Keisuke Nagasawa, Katsuhiko Takahashi and Takayuki Kataoka	Optimizing the configuration of labor-intensive production lines with the minimum number of workers
9139	Biao Yang, Nachiappan Subramanian and Shaima Al Harthy	Gender diversity issues in logistics and supply chain management: a systematic literature review
1096	Jana Kunecova, Andrea Bikfalvi and Pilar Marques	Sustainability orientation, Big Data and eco-innovation
3507	Yuki Kinoshita, Hiromasa Ijuin and Tetsuo Yamada	Modeling of Disassembly Parts Selection for Recycling, GHG Saving Rates and Cost using Linear Physical Programming

Session 3-4	Tuesday, 25.07.2023 16 ⁰⁰ - 17 ³⁰ hrs	Chairs: Jukka Hallikas, Yu-Ju Lin Bernini Room
1488	Ching-Hsin Wang, Chih-Han Chen, Ming-Lang Tseng, Ming K Lim and Anthony Shun Fung Chiu	Research on the Circular Economy Business Model of Intelligent Manufacturing of the Machine Tool Industry under the Digital Circular Economy Framework
1815	Ionut Marian Dobra, Adina Alexandra Dobra, Vladut Alexandru Dobra, Vlad Dacian Gavra and Silviu Folea	Air Quality analysis in the surrounding environments using a LoRa Network
2511	Isabella Gil, Isabela Dallabona, Pablo Carpejani, Edson Pinheiro de Lima, Ubirata Tortato, Sergio E. Gouvea da Costa and Fernando Deschamps	Management of stakeholders based on the GRI Standards
8091	Tanzin Ahmed and Esko Niemi	EU carbon border adjustment mechanism under economies of scale
8061	Gabriela Rus, Calin Vaida, Bogdan Gherman, Adrian Pislă, Laurentiu Nae, Paul Tucan, Doina Pislă and Mihai Ciupe	On the development and initial validation of WisdomOfAge - a matchmaking mentoring platform for sustainable development

Session	Workshop 3 - Increasing Production Resilience by Product and System Innovation Management	
	3-5	Wednesday, 26.07.2023 9 ⁰⁰ - 10 ³⁰ hrs
<i>Introduction, Jelena Borocki</i>		
9493	Emre Bilgin Sari and Dusan Sormaz	Bibliometric Analysis of Research for Resilience in Production and Industrial Systems
8688	Jelena Borocki, Vladimir Djakovic, Aleksandar Vekic and Olivera Cikota	Unlocking Innovation: A Pathway to Success for Early-Stage Ventures
4282	Emre Bilgin Sari, Dusan Sormaz and Omar Alhawari	Seru Production System: Model Proposal for Loading Problem in Multi-Skilled Worker Environment
6719	Saruda Seeharit, Dusan Sormaz, Mohammad Milad Omar and Mandvi Malik Fuloria	Application of Alternate Routes to Reduce Risk of Job Tardiness in Manufacturing Schedules
<i>Panel "Building Bridges to a Multipolar World: Embracing Innovation and Connectivity in the Permacrisis Era", panelists: Jelena Borocki, Djerdj Horvat, Emre Bilgin Sari</i>		

Session	Wednesday, 26.07.2023 11 ⁰⁰ - 12 ³⁰ hrs	Chairs: Claudiu Kifor, Ștefan Bodi Bernini Room
2164	Kuen-Suan Chen, Kim Hua Tan and Chun-Min Yu	A Carbon Reduction Evaluation Model for Industrial Processes Based on Circular Economy Paradigm
3222	Larissa Taquetti, Fernando Deschamps, Edson Pinheiro de Lima and Sergio E. Gouvea da Costa	The role played by digital technologies in implementing remanufacturing for the circular economy
3374	Karolina Werner-Lewandowska and Paulina Golinska-Dawson	Challenges and stimulators for collection of Waste of Electrical and Electronic Equipment - on the way to a circular supply chain
2810	Ioan Cionca, Emilia Ciupan, Mihai Ciupan and Cornel Ciupan	New ecological composite materials for upholstered furniture industry
9927	Emilia Brad, Miruna Peris, Ionut Chis and Vlad Trifan	Enhancing Machinery Performance and Minimizing Downtime with Real-Time Analytics and Machine Monitoring

Session 3.7	Wednesday, 26.07.2023 14 ⁰⁰ - 15 ³⁰ hrs	Chairs: Emre Bilgin Sari, Emilia Câmpean Bernini Room
939	Anca Stan, Emilia Brad, Ionut Adrian Chis and Costan-Vladut Trifan	The role of universities in increasing awareness of challenges related to Sustainable Development Goals. Case Study: Technical University of Cluj-Napoca
5424	Caio Cesar Ferreira, Nathalia Juca Monteiro, Sergio E. Gouvea Da Costa, Fernando Deschamps and Edson Pinheiro De Lima	Advanced energy management: guidelines to the industrial management
5573	Galina Robertson, Janne Heilala and Eduards Lapiņš	Certification and digital technologies for the sustainable success of manufacturing companies
5675	Isabela Dallabona, Isabella Gil, Pablo Carpejani, Edson Pinheiro de Lima, Ubirata Tortato, Sergio E. Gouvea da Costa and Fernando Deschamps	Strategic Corporate Sustainability Management (ESG) based on the materiality process: A systematic literature review
5857	Keisuke Nagasawa, Katsumi Morikawa and Katsuhiko Takahashi	Sustainable and resilient closed-loop supply chain network design with disruptions

Session 3.8	Wednesday, 26.07.2023 16 ⁰⁰ - 17 ³⁰ hrs	Chairs: Byung-Do Chung, Mircea Fulea Bernini Room
5124	Maxime Bouillon, Luca Mattia Gelsomino and Christiaan de Goeij	Industrial symbiosis, a key strategy for building resilient and sustainable supply chains
1953	Julian Perwitz, Thomas Sobottka, Ádám Szaller and Fazel Ansari	Simulation-based evaluation of optimized reconfigurable cellular manufacturing deploying a diversified workforce
7232	Tamer Abdulghani, Nizar Abdelkafi, Hans-Ruediger Lange and Herwig Winkler	The Digital Transformation in the Energy Sector to Meet Decarbonization Future Goals: Literature Review
9353	Juraj Šebo, Jasna Prester and Miriam Šebová	The role of Environmental Management Systems (EMS) and Energy Management Systems (EnMS) in the adoption of Energy Efficiency Technologies (EETs) in manufacturing companies in Central Europe
9478	Pablo Carpejani, Edson Pinheiro de Lima, Ubirata Tortato, Sergio E. Gouvea da Costa, Fernando Deschamps and Marcelo Miguel Tibes Peluso	Elaboration of a corporate sustainability strategy in an automotive company

TRACK 4 - INNOVATIVE AND SMART SOLUTIONS

Session 4.1	Monday, 24.07.2023 14 ⁰⁰ - 15 ³⁰ hrs	Chairs: Chin Yin Huang, Oliver Riedel Leonardo Room
9683	Cecilia Montt, Felisa Cordava and Alejandra Valencia	Improvement empty container management in medium-sized port logistics chains
3797	Stelian Brad, Bogdan Balog, Vlad Florian, Eyas Deeb and Ovidiu Stan	Innovative gripper design for electrical cabinet assembly in lean robotics
6536	Reto Wechner, Verena Lisa Kaschub, Michael Gräf, Matthias Bues, Benjamin Wingert and Oliver Riedel	Trends within creativity support tools: How to improve remote collaboration within new product development?
9200	Jukka Hallikas, Aleksi Harju and Mika Immonen	Digital Technology Resources and Leadership: Impact on Enabling Capabilities and Performance in Supply Chains
4191	Laura-Florentina Boanță, Alexandru Marin, Miron Zapciu and Bogdan-George Rânea	Methodology for an aggregate readiness level assessment of innovative technologies
109	Minjeong Kim, Ilkyeong Moon and Bogyeon Lee	Management models for electric scooter recharging under gig economy

Session 4.2	Monday, 24.07.2023 16 ⁰⁰ - 18 ⁰⁰ hrs	Chairs: Gonzalo Meija, Fernando Deschamps Leonardo Room
419	Gjulo Ashta, Daria Battini, Nicola Berti, Serena Finco and Alessandro Persona	Back-support exoskeleton impact on productivity and posture in order picking
8230	Francesco Pilati, Riccardo Tronconi and Karl Doerner	Tailored Adaptive Large Neighborhood Search to optimize a real-world logistic service for dependent patients
5142	Manuel Christian Jr Orias, Jose Edgar Mutuc and Anthony Shun Fung Chiu	Implications of Biomimetic Functional Trait Diversity on the Potential Operational Resilience of BPO Firms
9618	Andreas Werner, Frauke Schuseil and Moritz Hämmerle	Modular digital twin for generating product sustainability information
6832	Luis Quezada, Matias Contreras, Astrid Oddershede and Pedro Palominos	Prioritization of risks categorized under ISO 31,000 in construction projects using the Analytical Hierarchy Process
8854	Aurel Mihail Titu, Vasile Gusan and Mihai Dragomir	Integration of Collaborative Robots in the Automotive Industry during Post-Pandemic Recovery

Session 4.3	Tuesday, 25.07.2023 14 ⁰⁰ - 15 ³⁰ hrs	Chairs: Sigal Berman, Chang Tai Woo Leonardo Room
7279	Joseani Schreiber, Edson Pinheiro De Lima, Fernando Deschamps and Sergio Eduardo Gouvêa da Costa	Developing a framework for performance assessment of global distributed teams
2748	Aymee Batista, Natan da Silva, Emilia Cardoso and Renata Oliveira	Insights on the selection of international agribusiness markets using the Analytics Hierarchy Process
2532	Benjamin Schneider, Mehmet Kürümlüoğlu and Oliver Riedel	Current state of artificial intelligence based assistance systems in product development
3565	Pedro Palominos, Diego Cabrera, David Perez, Luis Quezada, Astrid Oddershede and Juan Barrientos	Support methodology for infrastructure decision-making in a smart city
352	Mateen Ashraf and Cathal Heavey	Prototype for traceability of supply chain with multiple Blockchains

Session 4.4	Tuesday, 25.07.2023 16 ⁰⁰ - 17 ³⁰ hrs	Chairs: Mathias Liewald, Chang Seong Ko Leonardo Room
7589	Radu Costin Moisescu, Constantin Olteanu, Petrica Tertereanu and Aurel Mihail Titu	Contributions to the modeling and optimization of data backup solutions within an industrial organization
3629	Nathalia Chamie, Fernando Deschamps, Sergio Eduardo Gouvêa da Costa and Edson Pinheiro de Lima	A Conceptual Framework for Combining Design Thinking and Lean Structures
7406	Yuxuan Zhou, Xun Wang, Mohamed Naim and Jonathan Gosling	Exploring the stability region of engineer-to-order archetypes with rework
9887	Adrian Bogorin Predescu, Aurel Mihail Titu and Constantin Oprean	Improving the quality of rapid prototyping processes of electronic control units by using a dedicated software platform
7214	Kotomichi Matsuno, Takahiro Ohno and Yoshikuni Edagawa	Decision-making model for packing substandard agricultural products in D2C

Session 4.5	Wednesday, 26.07.2023 9 ⁰⁰ - 10 ³⁰ hrs	Chairs: Joachim Lentes, Kirsten Lange Leonardo Room
2859	Kaiam Sou	Online Sales Promotion with Time-dependent Coupons
6418	Rudi Nurdiansyah, I-Hsuan Hong, Jack Su and Nai-Lun Pan	The Facility Layout Problem of Marine Current Turbines against Uncertainty
1819	Stelian Brad, Vlad Florian, Eyas Deeb, Dragos Bartos, Bogdan Balog, Ovidiu Stan and Stefan Bodi	Evaluating Precision and Repeatability of Industrial Robots Using Direct and Indirect Measurement Approaches
2308	Praditya Ajidarma and Shimon Nof	Skill-and-Knowledge Sharing by Augmented Reality: HUB-CI Model
2736	Niloofar Katirae, Ali Keshvarparast, Serena Finco and Martina Calzavara	Workforce individualization in Collaborative Assembly Line Balancing

Session 4.6	Wednesday, 26.07.2023 11 ⁰⁰ - 12 ³⁰ hrs	Chairs: Jae-Yoon Jung, Doina Pîslă Leonardo Room
3792	Geovana Pagnoncelli, Pablo Carpejani, Edson Pinheiro de Lima, Ubirata Tortato, Sergio E Gouvea da Costa and Fernando Deschamps	Internal process optimization for e-commerce D2C
3802	Arik Sadeh	Optimal repeated product management with customers' preferences
6505	Rob Dekkers, Ronald de Boer, Luca Mattia Gelsomino, Christiaan de Goeij and Qijun Zhou	The 3As for Theory: The Curious Case of Theory of Agency for Supply Chain Finance
292	Mei-Yao Chang, Jan-Pan Hwang and Rong-Song Wu	Research on Functional Values and Emotional Values of Customers by Implementing Multiple Services in the Hairdressing Industry
9747	Markus Steinlechner, Marlies Negele, Rafael Vreçar, Aaron Wedral, Astrid Weiss and Sebastian Schlund	Comparison of Competence Sources in Technology-Intensive Work Systems in Public Transport Maintenance

Session 4.7	Wednesday, 26.07.2023 14 ⁰⁰ - 15 ³⁰ hrs	Chairs: Juraj Šebo, Stelian Brad Leonardo Room
8273	Leticia Faria Moura, Rafael Paim Cunha Santos, Laís Fonsêca, Alexandre Cauduro, Priscila Paura and Claudia Araujo	Performance analysis of the organ donation and transplant process with process mining
9407	Wapee Manopiniwes, Takashi Irohara, Wannapha Nobnop and Pooriwat Muangwong	Implementation of Value Stream Mapping and Mathematical Model for Patient Scheduling in Radiotherapy Treatment
874	Tonja Heinemann, Oliver Riedel and Armin Lechler	Automating Test Cases for OPC UA Information Models
1958	Mustafa Can, Engin Gunes, Anil Akdogan and Ali Serdar Vanli	Electromechanical Hinge for RS-485 Connection and Door Position Sensor in Data Center Racks
6531	Elisa Medina, Luca Mattia Gelsomino, Antonella Moretto and Federico Caniato	How can Deep Tier Finance support Supply Chain Sustainability?

Session 4.8	Wednesday, 26.07.2023 16 ⁰⁰ - 17 ³⁰ hrs	Chairs: Leticia Faria Moura, Călin Vaida Leonardo Room
1977	Stefanie Findeisen	Requirements for the design of autonomous and stress-oriented Job Rotation
7555	Lisa Craiut and Constantin Bungau	Technology Transfer as an Accelerator of Post-Pandemic Industry Recovery
217	Gabriela Rus, Iulia Andras, Calin Vaida, Corina Radu, Bogdan Gherman, Paul Tucan, Alexandru Pusca, Nadim Al Hajjar and Doina Pisla	High accuracy dynamically balanced spherical arm for industrial and medical applications
5856	Astrid Oddershede, Luis Quezada, Cecilia Montt and Pedro Palominos	Decision model for attaining the relevant factors affecting port projects assessment.
7439	Cecilia Montt, Camila Vicencio, Luis Quezada, Astrid Oddershede and Alejandra Valencia	Action plan to prevent fatal road accidents using Data Mining

**WORKSHOP/TRACKS****“QUALITY AND INNOVATION IN ENGINEERING AND MANAGEMENT”
7TH EDITION****Convener: Călin Neamțu**

Session 1.9&2.9	Thursday, 27.07.2023 9⁰⁰ - 10³⁰hrs	Chairs: Călin Neamțu, Diana Dragomir Caravaggio Room
986	Claudiu Ioan Rusan, Cornel Ciupan, Mihai Ciupan and Dan Hurgoiu	Design and stiffness of a CNC milling router with reconfigurable aluminium structure
2578	Haruki Takahashi, Ibuki Shishido and Sumika Arima	Due date assignment of multi-product in Make-to-order supply chains
5443	Deborah Gabriela Sarria Garcia, Anis Assad Neto, Alexandre Surkus-Castro and Fernando Deschamps	Production line measurements as predictors: towards geometric quality assurance for assembly
655	Vigneshwar Pesaru	Machine learning algorithm-based parameters selection for meta-heuristic algorithm and its application to benchmark multi-objective flowshop scheduling problems.
3688	Mihai Ciupan, Claudiu Ioan Rusan and Emanuela Sorina Pop	Numerical calculation of pneumatic losses in a rotary vane compressor



Session 3.9&4.9	Thursday, 27.07.2023 9⁰⁰ - 10³⁰hrs	Chairs: Stelian Brad, Sorin Popescu Bernini Room
7263	Emilia Campean, Claudiu Abrudan and Mircea Arion	Intelligent predictive maintenance for the fault diagnosis of the electric induction motor
4932	David Grudzien, Edson Pinheiro, Fernando Deschamps, Sergio Eduardo Gouvêa and Darcleia Forlin	Importance-performance matrix application in order to prioritize performance objectives in sustainable operations
2777	Claudiu Ioan Rațiu and Camelia Ioana Ucenic	Smart solution for a greenhouse with controlled bioclimate
4517	Reginaldo Carreiro Santos, Edson Pinheiro de Lima, Fernando Deschamps, Sergio E. Gouvea da Costa, Elias Ribeiro da Silva and José Luís Martinho	Design Artefact for Selecting a Digital Transformation Project Portfolio
8002	Mircea Radu	Some significant moments and specific national approaches to consumer protection around the world
1926	Claudiu Ioan Rațiu and Camelia Ioana Ucenic	Increasing supply chain performance of a SME by increasing delivery function

Thursday, 27.07.2023
Closing Ceremony
11⁰⁰-12⁰⁰, Room Bernini

Post conference publications options

The 27th ICPR 2023 will publish the abstracts of the accepted papers in the form of an electronic book and will offer multiple post-publication options to authors:

- **International Journal of Production Research** - special issue (expected in 2024), by invitation only, indexed in ISI-SCIE Q1
- **International Journal of Production Economics** - special issue (expected in 2024), by invitation only, indexed in ISI-SCIE Q1
- **Lecture Notes in Production Engineering** - proceedings book volumes (expected in 2024), based on the International Scientific Committee's recommendation, indexed in SpringerLink, sent for indexing to ISI Books
- **Acta Technica Napocensis AMME** - special/proceedings issue (expected in 2023), based on the International Scientific Committee's recommendation or the authors' decision, indexed in ISI-ESCI and WorldCat
- Other local internationally indexed journals - regular issues (expected in 2023), based on the authors' decision

All papers undergo rigorous peer review in at least two stages, the abstract submission and the full paper submission. The full submission will be reviewed before, during and after the conference and the results will contribute to the decision concerning the publishing outlet.

Each of the submissions accepted for presentation will be presented with an adequate publishing option in line with the article content, its presentation and the options of the authors. Some of the partner journals could require additional peer review and changes.



2023 ICPR27

27th International Conference on Production Research
Cluj-Napoca, Romania, 23-28 July 2023



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