PRO-VE 2021

22nd IFIP / SOCOLNET Working Conference on Virtual Enterprises

PRO-VE

MINES
Saint-Étienne
Une école de l'IMT

Smart and Sustainable Collaborative Networks 4.0

PROGRAMME

Saint-Etienne, France
22-24 November 2021

CONTENT

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Smart and Sustainable Collaborative Networks 4.0

Widespread digital transformation in industry and services is strongly enabled by the results achieved through more than two decades of research and development in the inter-disciplinary Collaborative Networks (CNs) paradigm. The PRO-VE series of conferences, now in its 22nd edition, has been a successful vessel for both presenting innovative concepts and tools as well as providing proper sand box to investigate and intersect new models and approaches that address the raised challenges. As such, this annual conference gives a bird's-eye view of the CN area and its achieved milestones, identifies forthcoming open challenges, and proposes research directions that require developing novel and/or disruptive solutions. In the very last edition of the PRO-VE conference in 2020, the highlights of the past achievements in Collaborative Networks were structured as: CN1.0, CN2.0 and CN3.0. It further addressed the new emerging challenges in this area, e.g., the exponential increase in availability of both data and intelligence, the vast progress in digitalization, and the proper positioning of human in highly collaborative, dynamic, and resilient networks.

The academic world was then invited to fucus on addressing its newly introduced notion of Collaborative Networks 4.0, as the next generation of collaborative networks, in the era of applied Artificial Intelligence and Digital Transformation. By then, the following items were identified as the main challenges on which to focus: hybridization in CN structure, where network entities constitute organizations, people, intelligent systems and machines; formation of distributed cognitive systems; collaborative decision making among humans and intelligent autonomous systems; managing big data; mass collaboration, and collaborative creativity; and modeling and formalizing rights and liabilities, monetization, accountability, ethics, trust, coping with risks and disruptions. With this, the conference directed the community to focus on understanding and creating new collaboration culture and business models, with the purpose of addressing sustainable collaborative value creation.

PRO-VE 2021, this year organized at Mines Saint-Etienne, France, is the 22nd event in this series of successful conferences, including:

PRO-VE 1999 (Porto, Portugal), PRO-VE 2000 (Florianopolis, Brazil), PRO-VE 2002 (Sesimbra, Portugal), PRO-VE 2003 (Lugano, Switzerland), PRO-VE 2004 (Toulouse, France), PRO-VE 2005 (Valencia, Spain), PRO-VE 2006 (Helsinki, Finland), PROVE2007 (Guimaräes, Portugal), PRO-VE 2008 (Poznan, Poland), PRO-VE 2009 (Thessaloniki, Greece), PRO-VE 2010 (St. Etienne, France), PRO-VE 2011 (Säo Paulo, Brazil), PRO-VE 2012 (Bournemouth, UK), PRO-VE 2013 (Dresden, Germany) , PROVE 2014 (Amsterdam, The Netherlands), PRO-VE 2015 (Albi, France), PRO-VE 2016 (Porto, Portugal), PRO-VE 2017 (Vicenza, Italy), PRO-VE 2018 (Cardiff, UK), PRO-VE 2019 (Torino, Italy), and PRO-VE 2020 (Valencia, Spain).

Welcome to Saint-Etienne

Dear colleagues, welcome to Mines Saint-Etienne!
This is a great pleasure for FAYOL Institute to host the IFIP Working Conference on Virtual Enterprises for this challenging PRO-VE 2021 edition. This is also the second time that we are honoured by this mission after the first and great experience of PRO-VE 2010 and we hope to offer you again a very rich and exciting time for scientific and industrial exchanges.

PRO-VE 2021 is a great occasion. In this hard pandemic period, for us, as for many participants of the scientific community, this is really one of the first occasion to interact physically and to lead the scientific and industrial debates of the Conference in an on-site mode. **Our first ambition is to make the hybrid organization mode as rich and interactive as possible**. Of course, the COVID period was the occasion of lots of advances towards digitalisation to support our scientific activities: we hope having chosen for you pertinent and resilient solutions, to ensure a full interactivity between onsite and online participants with a full inclusion of everybody in the coming debates. **Collaboration is not only at the heart of the scientific orientations developed by the Conference: it is also the foundation of its internal organisation**. The great enthusiasm of the community to be present physically, the quality and variety of interaction modes offered by the Conference, as well as the innovation of PRO-VE 2021 to re-inforce the direct interaction and networking between academics and industrialists (see for instance the Industrial Workshop, fully integrated in the main program) should offer you many opportunities to capture new ideas, identify new research challenges or catalyse new collaborations.

Saint Etienne is a rather small town, however with an interesting and innovative environment. Along the three days of the Conference, through a rich social program, we hope to share with you a bit of the city's quality of life and some elements of its historical, scientific and industrial heritages. Mines Saint-Etienne Institution, with more than 200 years of education, research and innovation is also fully part of this heritage and actively continues to build the future of our society. FAYOL Institute, one of the five Research and Academic Centers at Mines Saint-Etienne, organizes PRO-VE 2021. At FAYOL Institute, the current societal transformations induced by the digital, ecological and industrial transitions are studied as the drivers of the efficiency, resilience and sustainability of the industry and territories of the Future.

I take this occasion to thank the Program Committee Chairs Luis Camarinha-Matos and Hamideh Afsarmanesh for the constant help in organizing the Conference. All my thanks to the whole team at Mines Saint-Etienne, which cope with the heavy challenge of an hybrid Conference under the coordination by Damien Lamy, Chair of the Organizing Committee.

We wish you all a great PRO-VE 2021 event physically and virtually!

Prof. Xavier Boucher
General Chair of the conference

Ass. Prof Damien Lamy
Chair of the Organizing Committee

Welcome to PRO-VE 2021

With this **22ⁿᵈ edition**, PRO-VE offers a very rich and exciting program, focused on the next generation of smart Collaborative Networks, with concerns of sustainability. Since its first edition in Porto, Portugal, in 1999, PRO-VE has played a fundamental role in the development of the discipline of Collaborative Networks (CNs) and its associated research community. Along the years, PRO-VE has been recognized by a number of distinct characteristics, such as: providing space for lively discussions of leading edge topics, promoting highly inspiring interactions among the experts from different backgrounds and disciplines with mutual appreciation, and recognition of the need for interdisciplinary perspectives to address collaborative networks challenges, and seeking excellence through adopting scientific solution to real world applications; thus contributing to development of sounder theories, methods, and tools.

The main theme for this edition – **Smart and Sustainable Collaborative Networks 4.0** - is very timely, focusing on the challenges of the ongoing 4th Industrial Revolution and the growing role of Artificial Intelligence in systems development. Collaborative Networks play a key role in the ongoing process of digital transformation in industry and services. This year, the focus is also on the role of CNs for the **sustainable development goals**. Many properties of CN 4.0 contribute to building a more resilient and sustainable world, providing that the socio-economic actors could implement efficient learning mechanisms applying the lessons learned from crises. The program of PRO-VE 2021 will provide excellent opportunities to discuss and gain better understanding of these trends.

With the support of the SOCOLNET international Society of Collaborative Networks and IFIP, especially through the WG 5.5 COVE, PRO-VE has contributed not only to the consolidation of the research community of Collaborative Networks but also to the identification of future research directions. We hope that this 22nd edition continues the same tradition, with your pro-active involvement in all its activities.

A special word of thanks goes the members of the International Program Committee that carried out the heavy task of evaluating the large number of submissions. Finally, we also want to express our gratitude for the work of the local organizing committee coordinated by Prof. Xavier Boucher, as well as by the support of the various sponsors of this year's event.

We wish you a great and memorable working conference, coordinated online from Saint Etienne.

Luis M. Camarinha-Matos
Program Committee Chair

Hamideh Afsarmanesh
Program Committee Co-chair

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SPECIAL SESSIONS ORGANIZERS

Special Session on Complex Collaborative Systems and Ontologies
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Lars Moench, Germany
Abdelhak Khemiri, France

Special Session on Value Co-creation in Digitally Enabled Ecosystems
Shaun West, Switzerland
Tobias Larsson, Sweeden

Special Session on Digitalization Strategy in Collaborative Enterprises' Networks
Lilia Gzara, France
Alejandro G. Frank, Brazil

Special Session on Pathways and Tools for DIHs
Gustavo Dalmarco, Portugal
Ana Cristina Barros, Portugal
António Lucas Soares, Portugal
Sergio Gusmeroli, Italy
Vasco Bernardo Teles, Portugal

Special Session on Socio-technical Perspectives on Smart Product-Service Systems
António Lucas Soares, Portugal
Henrique Silva, Portugal

Special Session on Knowledge Transfer and Accelerated Innovation in FoF
Adrian Florea, Romania
Luis M. Camarinha-Matos, Portugal
Fabiana Pirola, Italy
Arkadiusz Jurczuk, Poland

Special Session on Interoperability of IoT and CPS for Industrial CNs
Yacine Ouzrout, France
Keshav Dahal, UK
Nejib Moalla, France

Special Session on Sentient Immersive Response Network
Frederick Benaben, France
Benoit Montreuil, USA
Matthieu Lauras, France

Special Session on Digital Tools and Applications for Collaborative Healthcare
Daniele Spoladore, Italy
Elena Pessot, Italy

Special Session on Collaborative Networks & Open Innovation in Education 4.0
ArturoMolina, Mexico
María Soledad Ramírez-Montoya, Mexico
Jhonattan Miranda, Mexico

Special Session on Collaborative Learning Networks with Industry and Academia
Ana Correia Simões, Portugal
António Almeida, Portugal
Américo Lopes Azevedo, Portugal

Industrial Workshop
Carlo Leardi, Italy
Xavier Delorme, France
Vincent Chapurlat, France

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When coughing or sneezing, cover your mouth and nose with your arm or use a disposable tissue

Wear a mask anytime (available on request)

Respect distanciation whenever possible

Wash your hands frequently

Avoid close contact when greeting people

In public transports, respect distanciation (preferably one person per row)

⚠ The conference is subject to health pass

The pass must prove one of the following items:
• That you are **fully vaccinated** (with an EMA-approved vaccine):
  - Seven days after the second shot for two-shot vaccines (Pfizer, Moderna, AstraZeneca),
  - Four weeks after the shot for one-shot vaccines (Johnson & Johnson),
  - Seven days after the shot for vaccines administered to people who have already had COVID-19 (only one dose is necessary).
• OR that **you have been tested negative** (PCR or ANTIGEN) **within the last 72hrs** (to be renewed every 72hrs)
• **OR that you have recovered from COVID-19**, attested by a positive PCR or antigen test result, at least 15 days and no more than 6 months old

Passes can be **digital** (on the TousAntiCovid app) or in **paper form** (proof of vaccination or test result). They include **a QR code that will be scanned** on entry points of the conference location or events.

In addition:
- Specific procedures are taken for aeration of the rooms, in charge of room supervisors.
- Specific COVID measures for the meals (Lunchboxes at noon, because of Covid…).

Useful information

COVID Referent: Niloufare Sadr, 0477426696

EMERGENCY MEDICAL SERVICES: **15**

Nearest center for COVID tests: PHARMACIE NEYRET FAURIEL (67 Cours Fauriel)
APPOINTMENT IS COMPULSORY AND THE COST OF PCR TEST IS 25€
Contact: 04 77 25 23 56 / pharmacie.neyret.fauriel@gmail.com
Daily Time Periods for Covid Tests (requiring appointment): 11h-12h & 17h-18h

Hybrid format

The conference will be held in a hybrid format. All physical rooms are equipped with a webcam and microphone allowing broadcasts and discussions. This part will be handled by room managers (two per physical room)

Online access

The selected platform for the online part is Zoom. Each virtual room will be associated to a physical room as follows :

Amphitheatre A022: https://us02web.zoom.us/j/89747292909 (zoom1)
Amphitheatre A104: https://us02web.zoom.us/j/88583473906 (zoom2)
Room S120: https://us02web.zoom.us/j/89562859928 (zoom3)
Room S132: https://us02web.zoom.us/j/89878186386 (zoom4)

Password for all rooms: Pro-VE2021

Venue to the physical event
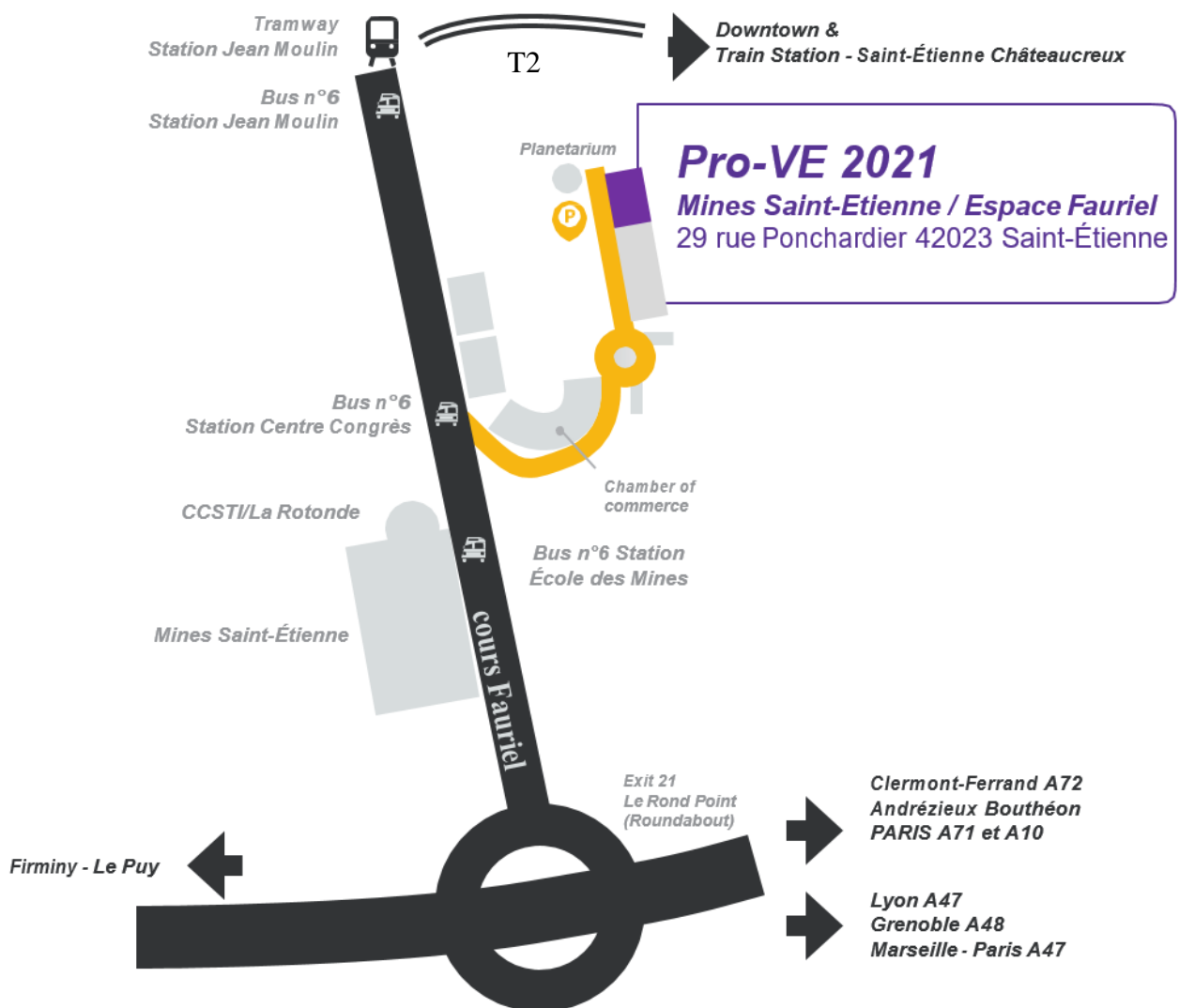
DETAILED PROGRAM SCHEDULE

		DAY 1-November 22nd	DAY 2-November 23rd	DAY 3 - November 24th		
08:30	09:00	Welcoming Coffee	Session 4-A A104 / Session 4-B S120 / Industrial Workshop Session 1 A022		08:30	09:00
09:00	09:30	Opening session	Session 4-A A104 / Session 4-B S120 / Industrial Workshop Session 1 A022	Session 6-A A104 / Session 6-B S120 / Session 6-C S132	09:00	09:30
09:30	10:00	Academic KEYNOTE (A022) Dmitry Ivanov, Germany	Session 4-A A104 / Session 4-B S120 / Industrial Workshop Session 1 A022	Session 6-A A104 / Session 6-B S120 / Session 6-C S132	09:30	10:00
10:00	10:30	Academic KEYNOTE (A022) Dmitry Ivanov, Germany	Session 4-A A104 / Session 4-B S120 / Industrial Workshop Session 1 A022	Session 6-A A104 / Session 6-B S120 / Session 6-C S132	10:00	10:30
10:30	11:00			Break	10:30	11:00
11:00	11:30	Session 1-A A104 / Session 1-B S120 / Session 1-C S132	Industrial KEYNOTE (A022) Jean Luc Garnier, France, Thales Group / AFIS	Session 7-A A104 / Session 7-B S120 / Session 7-C S132 / EU-DIGIFoF Dissemination Session S610	11:00	11:30
11:30	12:00	Session 1-A A104 / Session 1-B S120 / Session 1-C S132	Industrial KEYNOTE (A022) Jean Luc Garnier, France, Thales Group / AFIS	Session 7-A A104 / Session 7-B S120 / Session 7-C S132 / EU-DIGIFoF Dissemination Session S610	11:30	12:00
12:00	12:30	Session 1-A A104 / Session 1-B S120 / Session 1-C S132	LUNCH	Session 7-A A104 / Session 7-B S120 / Session 7-C S132 / EU-DIGIFoF Dissemination Session S610	12:00	12:30
12:30	13:00	LUNCH	LUNCH	LUNCH	12:30	13:00
13:00	13:30	LUNCH	LUNCH	LUNCH	13:00	13:30
13:30	14:00	Session 2-A A104 / Session 2-B S120 / Session 2-C S132	Session 5-A A104 / Session 5-B S120 / Industrial Workshop Session 2 A022	KEYNOTE lecture (A022) Jose Arturo Garza-Reyes, Great Britain	13:30	14:00
14:00	14:30	Session 2-A A104 / Session 2-B S120 / Session 2-C S132	Session 5-A A104 / Session 5-B S120 / Industrial Workshop Session 2 A022	KEYNOTE lecture (A022) Jose Arturo Garza-Reyes, Great Britain	14:00	14:30
14:30	15:00	Session 2-A A104 / Session 2-B S120 / Session 2-C S132	Session 5-A A104 / Session 5-B S120 / Industrial Workshop Session 2 A022	Session 8-A A104 / Session 8-B S120 / Session 8-C S132	14:30	15:00
15:00	15:30	Session 2-A A104 / Session 2-B S120 / Session 2-C S132	Session 5-A A104 / Session 5-B S120 / Industrial Workshop Session 2 A022	Session 8-A A104 / Session 8-B S120 / Session 8-C S132	15:00	15:30
15:30	16:00	Break	PANEL SESSION - ROUND TABLE (A022) "Crossed views : new collaboration forms among academics and industrials to pave the road for boosting a more sustainable industry "	Session 8-A A104 / Session 8-B S120 / Session 8-C S132	15:30	16:00
16:00	16:30	Session 3-A A104 / Session 3-B S120 / Session 3-C S132	PANEL SESSION - ROUND TABLE (A022) "Crossed views : new collaboration forms among academics and industrials to pave the road for boosting a more sustainable industry "	SCIENTIFC AWARDS CLOSING Ceremony A022	16:00	16:30
16:30	17:00	Session 3-A A104 / Session 3-B S120 / Session 3-C S132	PANEL SESSION - ROUND TABLE (A022) "Crossed views : new collaboration forms among academics and industrials to pave the road for boosting a more sustainable industry "	SCIENTIFC AWARDS CLOSING Ceremony A022	16:30	17:00
17:00	17:30	Session 3-A A104 / Session 3-B S120 / Session 3-C S132	PANEL SESSION - ROUND TABLE (A022) "Crossed views : new collaboration forms among academics and industrials to pave the road for boosting a more sustainable industry "	SCIENTIFC AWARDS CLOSING Ceremony A022	17:00	17:30
17:30	18:00	Walk to check Point	Bus Transfer to Art&Industry Museum	This planning is based on Paris Time — France/CET: 08:30 – 17:30; UK/Portugal: 07:30 – 16:30; Brazil: 03:30 – 12:30; China (Beijing): 14:30 – 23:30	17:30	18:00
18:00	18:30	Historical Center Visit	Museum VISIT		18:00	18:30
18:30	19:00	Historical Center Visit	Museum VISIT		18:30	19:00
19:00	19:30	Historical Center Visit	Museum VISIT		19:00	19:30
19:30	20:00	WELCOME RECEPTION - TOWN HALL	Bus Transfer to Gala Diner		19:30	20:00
20:00	-	WELCOME RECEPTION - TOWN HALL	CONFERENCE DINER		20:00	-

Venue layout

All rooms are in the same building. For the sixth Floor, elevators are available.

Registration Desk : Ground Floor (Rez de Chaussée)

Room Amphi A022: Entresol / Intermediary Floor (Entresol) – Right side
Web: https://us02web.zoom.us/j/89747292909

Room Amphi A104: First Floor – Right side
Web: https://us02web.zoom.us/j/88583473906

Room S120: First Floor – Left side
Web: https://us02web.zoom.us/j/89562859928

Room S132: First Floor – Left side
Web: https://us02web.zoom.us/j/89878186386

Room S610: Sixth Floor – Right side
Demonstration Room – DIGIFoF EU Project Dissemination Session

Breaks, Networking and Lunch

Coffee Breaks and Lunches: Sixth Floor – Left side

09:00 Opening session (A022 - zoom1)

09:30 Keynote 1: (A022 - zoom1)
Chair: Xavier Boucher

Multi-Disciplinary Understanding of Industry 4.0 in Supply Chain Networks and Using Digital Technology for Resilience Management
Prof. Dmitry Ivanov, HWR Berlin (Berlin School of Economics and Law), Germany

10:30 Coffee break

11:00 Parallel sessions - 1

1A: **Sustainable Collaborative Networks** (A104 - zoom2)
Chair: Paul Grefen

Brief Overview of Collaborative Approaches in Sustainable Manufacturing
Luis M. Camarinha-Matos, Andre Dionisio Rocha and Paula Graça

A Systematic Review of Sustainable Supply Chain Management Practices in Food Industry
Federica Minardi, Valérie Botta-Genoulaz and Giulio Mangano

Getting Collaborative Networks Sustainable: Drivers and Barriers Within a Digital Laboratories Network
Valentin Kammerlohr, Heiko Duin, Jannicke Baalsrud Hauge and Nadera Sultana Tany

1B: **Socio-technical Perspectives on Smart Product-Service Systems** (S120 - zoom3)
Chairs: António Lucas Soares, Henrique D. Silva

Product-Service System for the Pharmaceutical Industry
Mariusz Salwin, Andrzej Kraslawski, Michał Andrzejewski and Jan Lipiak

Smart Product Service System: Process Value Model in the Framework 3DCE
Thecle Alix and Gregory Zacharewicz

Digital Platforms as Enablers of Smart Product-Service Systems
Henrique Silva, António Lucas Soares

1C: **Human Factors in Collaboration 4.0** (S132 - zoom4)
Chair: Audrey Derrien

Antecedents of Constructive Human-AI Collaboration: An Exploration of Human Actors' Key Competencies
Thomas Süße, Maria Kobert, and Caroline Kries

Collaborative Plan to Reduce Inequalities among the Farms through Optimization
Ana Esteso, MME Alemany, Angel Ortiz, Rina Iannacone

Working beside Robots: A Glimpse into the Future
Paula Urze, João Rosas, Luis M. Camarinha-Matos

12:30 Lunch break

14:00 Parallel sessions - 2

2A: Analysis and Assessment of Business Ecosystems (A104 - zoom2)
Chair: Valerie Botta-Genoulaz

> Exploring Performance Assessment Scenarios in Collaborative Business Ecosystems
> *Paula Graça, Luís M. Camarinha-Matos*

> Platform-Based Business Ecosystems - A Framework for Description and Analysis
> *Christoph H. Wecht, Mike Demuth, Frank Koppenhagen*

> Organizational Maturity Assessment Model for Collaborative Networks
> *Fernando Zatt Schardosin, Carlos R. De Rolt*

2B: Knowledge Transfer and Accelerated Innovation in FoF (S120 - zoom3)
Chairs: Adrian Florea, Fabiana Pirola

> Implementation of IoT Platform's Dashboards for the Visualisation of Dynamic KPIs: Insights from a Case Study
> *Marco Venuta, Michela Zambetti, Fabiana Pirola, Giuditta Pezzotta, Piergiorgio Grasseni, Marco Ferrari, Stefano Slavi*

> BEDe: A Modelling Tool for Business Ecosystems Design with ADOxx
> *Maria-Sophie Schoder, Wilfrid Utz*

> Successful Knowledge Transfer – A Boost for Regional Innovation
> *Adrian Florea and Christoph Meinel*

2C: Value Co-creation in Digitally Enabled Ecosystems – I (S132 - zoom4)
Chairs: Shaun West, Tobias Larsson

> Value Co-creation in the Context of Digitally-enabled Product-Service Systems
> *Oliver Stoll, Wenting Zou, Eugen Rodel, Shaun West*

> Selling the Value of Complex Data-based Solution for Industrial Customers
> *Tuija Rantala, Tiina Valjakka, Kirsi Kokkonen, Lea Hannola, Mira Timperi and Leo Torvikoski*

> The Use of Goal Modelling for the Analysis of Value Co-Creation in Collaborative Networks
> *Garyfallos Fragidis*

15:30 Coffee break

16:00 Parallel sessions - 3

3A: Sustainability via Digitalization (A104 - zoom2)
Chair: André Rocha

> Towards a Sustainable Collaborative Distribution Network 4.0 with Blockchain Involvement
> *Nassim Mrabti, Mohamed Amine Gargouri, Nadia Hamani, Lyes Kermad*

> Using Fuzzy-based Approaches on Partner's Selection to Promote Sustainability on Collaborative Networks
> *Ricardo Santos, João Matias, Jose Soares, Pedro Carmona Marques, Victor Anes*

> Product-Service Systems Delivered by SMEs During Building Use Stage: Sustainability Criteria Framework
> *Davide Gamba and Elena Malakhatka*

3B: **Digitalization Strategy in Collaborative Enterprises' Networks** (S120 - zoom3)
Chair: Lilia Gzara

       Open and Collaborative Micro Services in Digital Transformation
         A. Luis Osório, Luis M. Camarinha-Matos, Tiago Dias, Carlos Gonçalves, José Tavares

       Collaboration through Digital Integration – An Overview of IT-OT-Integration Use-Cases and Requirements
         Jan Hicking, Max-Ferdinand Stroh, Sebastian Kremer

       A Collaborative Cyber-Physical Microservices Platform – The SITL-IoT Case
         Carlos Gonçalves, A. Luís Osório, Luís Camarinha-Matos, Tiago Dias, José Tavares

3C: **Value Co-creation in Digitally Enabled Ecosystems – II** (S132 - zoom4)
Chairs: Shaun West, Tobias Larsson

       Towards Sustainable Manufacturing through Collaborative Circular Economy Strategies
         Leila Saari, Vafa Järnefelt, Katri Valkokari, Jorge Tiago Martins and Federica Acerbi

       Collaborative Networks in Person-related Services – Designing Humane and Efficient Interaction Processes in Childcare
         Julia Friedrich, Vanita Römer, Kristin Gilbert, Christian Zinke-Wehlmann, Anne Steputat-Rätze, Ulrike Pietrzyk

       Physical Prototypes to Foster Value Co-creation in Product-service Systems Conceptual Design: A Case Study in Construction Equipment
         Alessandro Bertoni, Ryan Ruvald

17:30 Walk to check point
18:00 Historical center visit
19:30 Welcome reception – City Hall

08:30 Parallel sessions - 4

4A: **Maintenance and Life-Cycle Management** (A104 - zoom2)
  Chair: Julia Friedrich

> Supporting Predictive Maintenance in Virtual Factory
> *Go Muan Sang, Lai Xu, and Paul de Vrieze*

> Reconfigurable Supply Chain Performance: A Bibliometric Analysis
> *Slim Zidi, Nadia Hamani and Lyes Kermad*

> A MILP Model for Reusable Containers Management in Automotive Plastic Components Supply Chain
> *Eduardo Guzman, Beatriz Andres and Raul Poler*

> End-of-Life Product Recovery Optimization of Disassembled Parts based on Collaborative Decision-making
> *Elham Jelodari Mamaghani, Xavier Boucher*

4B: **Interoperability of IoT and CPS for Industrial CNs** (S120 - zoom3)
  Chair: Keshav Dahal

> Sustainable Peatland Management with IoT and Data Analytics
> *Jiun Terng Liew, Aduwati Sali, Nor Kamariah Noordin, Borhanuddin Mohd. Ali, Fazirulhisyam Hashim, Syamsiah Mashohor, Nur Luqman Saleh, Yacine Ouzrout and Aicha Sekhari*

> Business Analytics in Production Management – Challenges and Opportunities using Real-World Case Experience
> *Andrea Kő and Tibor Kovács*

> Industrial Collaborative Robotics Platform
> *Luís Vicente, Pedro Lomelino, Fernando Carreira, Francisco M. Campos, Mário J. G. C. Mendes, A. Luís Osório, J. M. F. Calado*

> DSRC or LTE? Selecting the Best Medium for V2I Communication using Game Theory
> *Evangelos D. Spyrou, Afroditi Anagnostopoulou, Chrysostomos Stylios*

I1: **Industrial Workshop – I** (A022 - zoom1)
  Chairs: Carlo Leardi, Tetrapak, Suzanne Vernim

> Opening of workshop

> Exploring the Best Practices for Co-innovation in Industry and Academy Collaboration – Four Practical Case Examples
> *Katri Valkokari, Pasi Valkokari, Tuija Rantala and Jutta Nyblom*

> Simulation Model for a Semi-automated Retail Order Picking System under Uncertainty
> *Sawssen Souiden, Audrey Cerqueus, Xavier Delorme, Jean-Lucien Rascle*

10:30 Coffee break

11:00 Keynote 2: (A022 - zoom1)
  Chair: Vincent Chapurlat

> **Architecting can orient for smart and sustainable system solutions**
> ***Jean-Luc Garnier***, *Thales Group, France*

12:00 Lunch break

13:30 Parallel sessions - 5

5A: **Simulation and Optimization** (A104 - zoom2)
Chair: Thècle Alix

Research on Configuration Framework of Simulation Rules Based on Existing Simulation Teaching Platform
Wenqiang Li, Juanqiong Gou, Shuyao He, Zhe Wang

A Federated Simulation Framework for Cross-Organisational Processes
Rushan Arshad, Paul Ton de Vrieze, Lai Xu

Robust Optimization for Collaborative Distribution Network Design Problem
Islem Snoussi, Nadia Hamani, Nassim Mrabti, Lyes Kermad

Simulating Impact of Smart Product-Service Systems
Christian Zinke-Wehlmann, Sebastian Frericks, and Andreas Kluge

5B: **Digital Tools and Applications for Collaborative Healthcare** (S120 - zoom3)
Chairs: Daniele Spoladore, Elena Pessot

Fostering the Collaboration among Healthcare Stakeholders with ICF in Clinical Practice: EasyICF
Daniele Spoladore, Atieh Mahroo and Marco Sacco

Collaborative Design Approach for the Development of an Ontology-based Decision Support System in Health Tourism
Daniele Spoladore, Elena Pessot, Michael Bischof, Arnulf Hartl and Marco Sacco

Analyzing Hospital Sterilization Service Vulnerabilities Using a Risk-aware Business Process Modeling Method
Rafika Thabet, Maria Di-Mascolo, Elyes Lamine, Ghassen Frikha, Hervé Pingaud

Designing a Collaborative Personal Assistance Model for Persons with Disabilities: The Portuguese Independent Living Case
Patrícia Macedo, Filipa Ferrada, Ana Inês Oliveira, Rui Neves Madeira

I2: **Industrial Workshop – II** (A022 - zoom1)
Chairs: Xavier Delorme, Vincent Chapurlat

Sustainable Horizontal Collaboration: A Case Study in Moroccan Dry Foods Distribution
Hanan Ouhader and Malika El Kyal

Extending Value in Legacy Production Systems: Insights from the Liquid Food Processing
Brendan P. Sullivan, Monica Rossi, David Ward, Carlo Leardi

Advancing Circular Economy: Research Roadmap for Circular Integrated Production Systems
Magdalena Paul, Simon Thevenin, Julia Schulz, Nadjib Brahimi, Hichem Haddou Benderbal, Alexandre Dolgui

15:30 Coffee break

16:00 Panel Session *Crossed views: New forms of collaboration among academics and industrialists* - part of SOCOLNET General Assembly – Open to all attendees (A022 - zoom1)

Moderator: Prof. Xavier Delorme, Mines Saint-Etienne

Academic Panelists: Frederick Benaben (IMT Mines Albi), Antonio Lucas Soares (Inesctec), Suzanne Vernim (Technical University of Munich), Paul Grefen (Eindhoven University of Technoloy)
Industrial Panelists: Carlo leardi (Tetrapak), François Vuillaume (Elm leblanc – Bosch Group France), Jean Luc Garnier (Thales Group - AFIS)

17:30 Bus transfer to Art & Industry Museum
18:00 Museum visit
20:00 Gala dinner at Chateau de Bouthéon

Wednesday: 24 Nov 2021

09:00 Parallel sessions - 6

6A: Safety and Collaboration Management (A104 - zoom2)
Chair: Vincent Augusto

Collaborative Safety Requirements Engineering: An Approach for Modelling and Assessment of Nuclear Safety Requirements in MBSE Context
Emir Roumili, Jean-François Bossu, Vincent Chapurlat, Nicolas Daclin, Robert Plana, Jérôme Tixier

A Model to Manage Organizational Collaborative Networks in a Pandemic (Covid-19) Context
Marco Nunes, António Abreu, Jelena Bagnjuk

Measuring Complexity for Collaborative Business Processes Management
Youssef Marzouk, Omar Ezzat, Khaled Medini, Elyes Lamine, Xavier Boucher

6B: Pathways and Tools for DIHs – I (S120 - zoom3)
Chair: Gustavo Dalmarco

Experimentation of Cross-Border Digital Innovation Hubs (DIHs) Cooperation and Impact on SME Services
Margherita Volpe, Omar Veledar, Isabelle Chartier, Isabelle Dor, Fredy Ríos Silva, Jure Trilar, Csaba Kiraly, Gabriele Gaffuri, Sabine Hafner-Zimmermann

Problematizing the Service Portfolio of Digital Innovation Hubs
Fredrik Asplund, Hugo Daniel Macedo and Claudio Sassanelli

Digital Innovation Hubs: One Business Model Fits All?
Gustavo Dalmarco, Vasco Teles, Olivia Uguen, Ana Cristina Barros

6C: Collaborative Learning Networks with Industry and Academia (S132 - zoom4)
Chair: Ana Simões

Education 4.0 and the Smart Manufacturing Paradigm: A Conceptual Gateway for Learning Factories
Leonor Cónego, Rui Pinto, Gil Gonçalves

Innovative Learning Scheme to Up-skilling and Re-skilling – Designing a Collaborative Training Program between Industry and Academia towards Digital Transformation
Ana Correia Simões, Filipe Ferreira, António Almeida, Ricardo Zimmermann, Hélio Castro and Américo Azevedo

Complementarity of European RIS Territories Towards Manufacturing Educational Products
Panos Stavropoulos, Alexios Papacharalampopoulos, Harry Bikas, Lydia Athanasopoulou, Anna-Maria Korfiati, Christos K. Michail

10:30 Coffee break

11:00 Parallel sessions – 7

7A: **Policies and New Digital Services** (A104 - zoom2)
Chair: João Calado

Analysis Model to Identify the Regional"Strategic Bets" of Startup Porto's Network
Claudio Roth, Carla Pereira, Rafael Pedrosa, Maria Roth

Behavior Data Collection in Collaborative Virtual Learning Environments
Tianqi Wu, Juanqiong Gou, Wenxin Mu and Zhe Wang

Collaborative Trusted Digital Services for Citizens
A. Luis Osório, Luis M. Camarinha-Matos, Adam Belloum, Hamideh Afsarmanesh

7B: **Pathways and Tools for DIHs – II** (S120 - zoom3)
Chair: Gustavo Dalmarco

Business Intelligence & Innovation: A Digital Innovation Hub as Intermediate for Service Interaction and System Innovation for Small and Medium-sized Enterprises
Florian Maurer

The D-BEST based Digital Innovation Hub Customer Journeys Analysis Method: A Pilot Case
Claudio Sassanelli, Sergio Gusmeroli, Sergio Terzi

A Framework to Strengthen Collaboration between Universities and Industrial-related Entities towards Boosting Industry 4.0 Adoption and Development
Ricardo J. Rabelo

7C: **Collaborative Networks and Open Innovation in Education 4.0 – I** (S132 - zoom4)
Chair: Alessandro Bertoni

Diagnostic Instrument of the Level of Competencies in Cloud Computing for Teachers in Education 4.0
Gloria-Concepción Tenorio-Sepúlveda, Katherine-del-Pilar Muñoz-Ortiz, Cristóbal-Andrés Nova-Nova and María-Soledad Ramírez-Montoya

"Speed-dating" as a Learning Method in Online Synchronous Classes
Donovan Esqueda-Merino, Diego Mondragón, Luis A. Calvillo-Corona, César A. Aldana-Pérez, Jesús E. Chong-Quero

A Gamified HMI as a Response for Implementing a Smart-Sustainable University Campus
Juana Isabel Méndez, Pedro Ponce, Therese Peffer, Alan Meier, and Arturo Molina

12:30 Lunch break

13:30 Keynote 3: (A022 - zoom1)
Chair: Xavier Delorme

Addressing the Environmental Challenge through Sustainable Supply Chains
Prof. Jose Arturo Garza-Reyes, Centre for Supply Chain Improvement, University of Derby, UK

14:30 Parallel sessions - 8

8A: **Sentient Immersive Response Network** (A104 - zoom2)
Chair: Matthieu Lauras, Frederick Benaben

Toward Resilient and Efficient Maintenance Planning for Water Supply Networks
Marine Dubillard, Guillaume Martin, Matthieu Lauras, Xavier Lorca and Jean Cantet

Atomic Supply Chain Modelling for Risk Management based on SCOR
Thibaut Cerabona, Matthieu Lauras, Jean-Philippe Gitto, Benoit Montreuil, Frederick Benaben

Towards a Collaborative and Open Supply Chain Management Operating Services Platform
Matthieu Lauras, Raphaël Oger, Jiayao Li, Benoit Montreuil, Markus Kohl, Andreas Habl and Julien Lesbegueries

8B: **Complex Collaborative Systems and Ontologies** (S120 - zoom3)
Chair: Claude Yugma

Compliance Checking of Collaborative Processes for Sustainable Collaborative Network
Oyepeju Oyekola, Lai Xu, Paul de Vrieze

Identification of Service Platform Requirements from Value Propositions: A Service Systems Engineering Method
Onat Ege Adali, Baris Ozkan, Oktay Turetken, Paul Grefen

A Modular Ontology Framework for Building Renovation Domain
Prathap Valluru, Janakiram Karlapudi, Teemu Mätäsniemi, Karsten Menzel

8C: **Collaborative Networks and Open Innovation in Education 4.0 – II** (S132 - zoom4)
Chair: Giuditta Pezzotta

Education 4.0 Reference Framework for the Design of Teaching-Learning Systems: Two Case Studies Involving Collaborative Networks and Open Innovation
Jhonattan Miranda, Maria Soledad Ramírez-Montoya, Arturo Molina

A Framework for Education 4.0 in Digital Education Ecosystems
Claudia-Melania Chituc

Collaborative Decision-Making Model of Green Supply Chain: Cloud-Based Metaheuristics
Ehsan Yadegari and Xavier Delorme

16:00 Coffee break

16:30 Closing Session & Awards (A022 - zoom1)

17:30 End

Multi-Disciplinary Understanding of Industry 4.0 in Supply Chain Networks and Using Digital Technology for Resilience Management
Prof. Dmitry Ivanov, HWR Berlin (Berlin School of Economics and Law), Germany

Abstract. While Industry 4.0 has been trending in practice and research, supply chain engineering and management studies in this area remain nascent. In the first part or our talk, we present the results of a large-scale, cross-disciplinary and global survey on Industry 4.0 topics among researchers in industrial engineering, operations management, operations research, control and data science whose intent is to understand the current state of research in Industry 4.0 in different disciplines and deduce insights and opportunities for future research. In the second part of our talk, we discuss fundamental theoretical constructs and practical applications to engineer and manage supply chain networks at the times of Industry 4.0. In particular, we debate about digital twins, digital platforms, structure dynamics control, intertwined supply networks, supply chain ecosystems, viable and reconfigurable supply chains to manage resilience and ripple effects using examples of the COVID-19 pandemic.

Bio. Prof. Dr. Dr. habil. Dmitry Ivanov is professor of Supply Chain and Operations Management at Berlin School of Economics and Law (HWR Berlin). His research explores structural dynamics and control in complex networks, with applications to supply chain resilience, scheduling in Industry 4.0 systems, supply chain simulation, risk analytics and digital supply chain twins. His research coined several seminal academic and practical directions such as the ripple effect in supply chains and supply chain viability. His research record includes over 360 publications, with over 100 papers in prestigious academic journals, three editions of the leading textbook "Global Supply Chain and Operations Management", and several research books. He is a recipient of numerous scientific awards. He is passionate about bridging the knowledge of different disciplines and applying it to solution of practically relevant problems. He delivered invited plenary, keynote and panel talks at the conferences of INFORMS, IFPR, DSI, IFAC, and IFIP. He is leading working groups, tracks and sessions on the Digital Supply Chain, Supply Chain Risk Management and Resilience in global research communities. He holds active editorial positions at several prestigious international journals. He is Chairman of IFAC TC 5.2 "Manufacturing Modelling for Management and Control" and has been Chairman, IPC and Advisory Board member of over 60 international conferences.

Architecting can orient for smart and sustainable system solutions
Jean-Luc Garnier, Thales Group, France

Abstract. Architecting activities allow expressing, on one hand, requests, expectations, needs or reluctances regarding a situation including an entity of interest, with definition of concerns, viewpoints and acceptance criteria of the stakeholders; and, on the other hand, fundamental concepts or properties of this entity of interest in its environment, with governing principles and processes over its related life cycle. These activities support a collaborative decision making process by nature; nevertheless, the architects are mandated by organizations having their strategies, their business models and following regulatory constraints. Consequently, the Architectures shall take into account the enterprise objectives, policies, organization, ethical considerations, cultural aspects, standards, laws and other matters. As illustrated with examples within this keynote, architectures define the solution space for the whole set of life cycle processes sustaining the entity of interest for the benefits of the stakeholders with consideration of their activities and long-term quality of life in an evolving context. In the past, the Architecting effort mainly focused on the quality of the delivered products. Nowadays, new trends are to consider the concepts of usage, sustainability, resilience and trustworthiness of the solutions where the systems take place.

Bio. Jean-Luc Garnier is Systems Engineering and Architecting Director within the Thales Technical Directorate. His domain of expertise is real-time distributed systems. From 1984 to 1999, he had been software engineer and expert within consulting companies, mainly on compilers, operating systems and real-time telecoms developments. He joined Thales in 2000 as system architect, successively in Integrated Modular Avionics, Electronic Warfare and Network Centric Warfare. He is co-author of the Thales Systems Engineering Methodology and author of several handbooks. He teaches Operational analysis, Systems Engineering and Architecting at the Thales Learning Hub and the NATO School. He is president of the French Chapter of INCOSE (French Chapter of the International Council on Systems Engineering). He also chairs Architecture Working Groups within INCOSE, AFNOR (French Chapter of ISO) and EDA (European Defence Agency). He is project leader of the ISO/IEC/IEEE-42020 (Architecture processes) and ISO/IEC/IEEE-42010 (Architecture Description) standards; and co-editor of the NATO Architecture Framework.

Addressing the Environmental Challenge through Sustainable Supply Chains
Prof. Jose Arturo Garza-Reyes, Centre for Supply Chain Improvement, University of Derby, UK

Abstract. Over the years, rapid industrialisation around the globe has, on one hand, improved quality of life, whereas on the other hand, it has also had a significant negative effect on our environment. This has contributed to the phenomenon of environmental degradation arguably being one of the biggest challenges currently faced by mankind and the planet. In this scenario, governments, supply chains, organisations, and societies, in general, have tried to take action to address this problem by formulating, developing, implementing and encouraging environmentally friendly policies, technologies, working practices and behaviours. In particular, significant contributions from the operations management field have been made and implemented in the supply chains of various industrial sectors for organisations to not only achieve traditional objectives such as profitability, efficiency, customer satisfaction, quality, and responsiveness but also a better environmental performance. This keynote contribution emphasises the relevance of the environmental degradation challenge and reviews some of the wider concepts that have been proposed and deployed in supply chain operations to tackle it. In particular, the talk delves into the operations management concepts and methodologies that have been proposed and adapted by supply chains to improve the environmental performance of their operations.

Bio. Jose Arturo Garza-Reyes is a professor of Operations Management and Head of the Centre for Supply Chain Improvement at the University of Derby, UK. He is actively involved in industrial projects where he combines his knowledge, expertise and industrial experience in operations management to help organisations achieve excellence in their internal functions and supply chains. He has also led and managed international research projects funded by the British Academy, British Council, European Commission and Mexico's National Council of Science and Technology (CONACYT). As a leading academic, he has published over 200 articles in leading scientific journals, international conferences and seven books. Prof. Garza-Reyes is Associate Editor of the Int. J. of Operations and Production Management, Associate Editor of the Journal of Manufacturing Technology Management, Editor of the Int. J. of Supply Chain and Operations Resilience and Editor-in-Chief of the Int. J. of Industrial Engineering and Operations Management. Areas of expertise and interest for Professor Garza-Reyes include general aspects of operations and manufacturing management, business excellence, quality improvement, and performance measurement.

Reconfigurable Production in the era of industry 4.0

Focus on Collaborative Networks 4.0
Nov 23 | 8:30 a.m. - 17 p.m. |
Online participation: **zoom1**
Physical participation: **Amphi A 022.**

In collaboration with Socolnet Scientific Society, IMT & TUM organise a new industrial workshop supported by German-French academy for the industry of the future and part of PRO-VE 2021 IFIP Conference. Academic and industrial speakers engaged in industrial engineering have been invited to participate in the seminar and to explore this year's topic around collaborative networks 4.0 and their implication in social and environmental global terms. During the day, we will:

- Put forth collaborative challenges for industrial research
- Provide evidence of various forms of collaborative research
- Discuss issues related to industry of the future and reconfigurable production systems

It is our goal to provide a platform for interdisciplinary exchange and to create a basis for further industrial innovation programs and research collaborations.

08:30 – 10:30 Workshop Session 1: Simulation for order picking, circular economy, integrated production systems

Paper: Exploring the Best Practices for Co-innovation in Industry and Academy Collaboration – Four Practical Case Examples
Katri Valkokari, Pasi Valkokari, Tuija Rantala and Jutta Nyblom

Paper: Simulation Model for a Semi-automated Retail Order Picking System under Uncertainty
Sawssen Souiden, Audrey Cerqueus, Xavier Delorme, Jean-Lucien Rascle

Communication: CIME Chair Industrial/Academic collaboration: objectives, principles and results, perspectives
Vincent Chapurlat, IMT Mines-Ales

Communication: Italian Cluster of Intelligent Factories: an example of collaborative network
Rosanna Fornasiero, CNR

Workshop discussion and debate
Moderators : *Carlo Leardi and Suzanne Vernim*

10:30 – 11:00   Break and networking

11:00 - 12:00   Industrial Keynote - Architecting can orient for smart and sustainable system solutions
Jean Luc Garnier, Thales Group - Director for Systems Engineering and Architecting Director for Thales   Technical Directorate, President of the French Chapter of INCOSE

12:00 – 13:30   Lunch

13:30 – 15:30   Workshop Session 2: Co-innovation, sustainable collaboration, value extending in production

Sustainable Horizontal Collaboration: A Case Study in Moroccan Dry Foods Distribution
Hanan Ouhader and Malika El Kyal

Extending Value in Legacy Production Systems: Insights from the Liquid Food Processing
Brendan P. Sullivan, Monica Rossi, David Ward, Carlo Leardi

Advancing Circular Economy: Research Roadmap for Circular Integrated Production Systems
Magdalena Paul, Simon Thevenin, Julia Schulz, Nadjib Brahimi, Hichem Haddou Benderbal, Alexandre Dolgui

Workshop discussion and debate
Moderators: Xavier Delorme and Vincent Chapurlat

15:30 – 16:00   Break

16:00 – 17:30   Panel Session - ROUND TABLE
Crossed views: New forms of collaboration among academics and industrialists
(part of SOCOLNET General Assembly – Open to all attendees)

Moderator: Prof. Xavier Delorme, Mines Saint-Etienne

Academic Panelists: Frederick Benaben (IMT Mines Albi), Antonio Lucas Soares (Inesctec), Suzanne Vernim (TUM), Paul Grefen (Eindhoven University)

Industrial Panelists: Carlo leardi (Tetrapak), François Vuillaume (Elm leblanc - Bosch), Jean Luc Garnier (Thales Group)

17:30   End of session and Bus Transfer to Art & Industry Museum

Sponsors for the Industrial Workshop

https://www.digifof.eu/

European Dissemination Session: EU DIGiFoF Project and OMILAB Network
"Digital Design Skills for Factories of the Future"
Mines Saint-Etienne- Espace Fauriel – 6th Floor (Salle 610)
24/11/2021 – 11:00 till 12:30

The DIGIFOF EU project proposes a network of training environments where HEIs, enterprises and training insitutions come together to develop skill profiles, training concepts as well as materials for design aspects of the Factory of the Future (FoF). An international network of OMILAB Laboratories aims at providing educational and experimental OMiLAB4FoF laboratories, where FoF-aspects can be taught practically or experimented with. These will be equipped with modelling, simulation and analysis tools targeting: strategic aspects of FoF (innovative business models, product-service systems, design thinking, crowd-production), process aspects (business process management, enterprise architecture management, product-lifecycle-management) and systems aspects (digital factory, product design, CPS and embedded intelligence, security and safety management).

Session Chairmen: Adrian Florea (RO – ULBS) – Wilfrid Utz (DE – OMILAB)

11:00 – 11:10 – DigiFoF EU project: Ambition and key Outputs – Adrian Florea
11:10 – 11:20 – OMILAB international initiative and network – Wilfrid Utz
11:20 – 12:00 – OMILAB interactive demonstrations – Wilfrid Utz
12:00 – 12:15 – Posters-Short highlights on European OMILAB initiatives
  ▪ Italy, Bergamo University, UNIBG
  ▪ Romania, Sibiu University, ULBS
  ▪ France, Mines Saint-Etienne, EMSE

12:15 – 12:30– Questions and interactions – Wilfrid Utz, Adrian Florea

*These **FoF Designer Laboratories are** build on the notion of **Digital Business Models** and employ a **Digital Twin** as a conceptual representation of an intelligent offering, which **a)** must be co-designed by domain experts and innovators from different backgrounds, b) provides an adequate virtualization of reality, considering domain-specificity and the value to be created, and **c)** enables experimentation and evaluation based on "**Smart Models***

DAY 1 – 18:00 - Historical center visit

Named after Saint Stephen, the city first appears in the historical record in the Middle Ages as Saint-Étienne de Furan (after the River Furan, a tributary of the Loire). In the 13th century, it was a small borough around the church dedicated to Saint Etienne. On the upper reaches of the Furan, near the Way of St. James, the Abbey of Valbenoîte had been founded by the Cistercians in 1222. In the late 15th century, it was a fortified village defended by walls built around the original nucleus.

From the 16th century, Saint-Étienne developed an arms manufacturing industry and became a market town. It was the start of industrial development, increasing the town's importance. The city also became a center for the manufacture of ribbons and passementerie starting in the 17th century.

Later, it became a mining center of the Loire coal mining basin and, later, became recognized for its bicycle industry. In the first half of the 19th century, it was only a chief town of an arrondissement in the department of the Loire, with a population of 33,064 in 1832. The concentration of industry prompted these numbers to rise rapidly to 110,000 by about 1880. It was this growing importance of Saint-Étienne that led to its being the main office of the prefecture and the departmental administration on 25 July 1855, when it became the chief town in the department and office of the prefect, replacing Montbrison. Saint-Étienne absorbed the commune of Valbenoîte and several other neighbor localities on 31 March 1855.

DAY 1 – 19:30 – Welcome Reception by the City of Saint Etienne
RDV: End of historical visit, 19:30. Location: Maison du projet, 10 rue Louis Braille (Close to town hall).

Many thanks to the City of Saint Etienne for its strong support of the International Scientific Community of IFIP and Socolnet.

The welcome reception will be the occasion to welcome the 19 countries which offer the large international reach and share of knowledge of PROVE 2021: Austria, Brazil, China, Denmark, Italy, Finland, France, Germany, Greece, Hungaria, Mexico, Netherland, Poland, Romania, Spain, Sweden, Switzerland, United Kingdom !

DAY 2 – 18:00 – Art and Industry Museum
RDV: Mines Saint-Etienne 17:30 (Bus) or Museum 18:00.

Through its content, the museum offers a look at the everyday art and design industries. The museum also opens up to the contemporary world, through its museography on new information and communication technologies. The computerization of the inventory and the digitization of the images of the collections, as well as the major film-making campaigns on traditional know-how and the new technologies. The museum's anchoring in the history of the city is manifested by the passage through it of several visits offered by "City of Art and History". But the museum is attentive to contemporary reality by opening up to the living industries of the region in the fields of arms, cycles and textiles.

A concrete approach to history and industrial creation embodied in the regional heritage. Through a museography adapted to different levels, we discover, floor by floor, the collections of weapons, ribbons or cycles. Clear and animated explanations, made interactive by touch screens, allow a free visit with personalized routes. The multiple approaches encourage a transversal reading of the collections and call on a wide variety of disciplines: letters, plastic arts, history, technology, science, etc. The mediators are available to the public for guided tours. Looms demonstrations are regularly performed by the trimmers.

DAY 2 – 10:00 – Gala Dinner, Château de Bouthéon
RDV: Museum Art & Industry 19:30 (Bus).

The first texts which evoke the castle of Bouthéon (formerly Bothéon) tell us that it has existed at least since the thirteenth century, even if its architecture has evolved considerably since that time. This stronghold, which made it possible to monitor both the Loire river, the plain and the mountains of Forez, the mountains of Lyonnais and Pilat, was owned by the counts of Forez between the thirteenth century and the fourteenth century before passing into hands of Gaudemar de Reveux and his heirs, lords of Fay, in 1322, then Robert de Chalus in 1386 and finally Louis de Joyeuse around 1403.

Currently, the castle itself is made up of two large parallel buildings, opening onto a large courtyard. The north building is a long construction terminated by two tall towers. It is said to have been built at the end of the 15th century by Mathieu de Bourbon and greatly altered in the 19th century in a neo-Gothic style by Claude Coignet, ribbon maker from Saint-Etienne. The south building is a long construction terminated on one side by a greenhouse and on the other by the reception tower. This building seems more recent than the north building, in particular because of the roof and the plaster covering the pebble facade of the Loire. This new aspect of the south wing dates from the sixteenth century with the passage of Guillaume de Gadagne as owner. In reality, it is the oldest construction of the castle since it contains the remains of the medieval keep, today totally invisible from the outside. In the lower courtyard of the castle (south side), the ancillary premises are made up of places to visit (saddlery; forge; shelters for trolleys, horse-drawn carriages, thresher, still) and technical areas (storage boxes, boiler room, etc.).

In 2004, restoration work on Bouthéon castle brought to light, under the dormant bridge leading to the main courtyard, a capon sparrow, probably built in the 15th century to protect the castle. The weapons that were used in this sparrow could be fanged hacquebutes. The peculiarity of this sparrow is its location in the middle of the dry moat, without ties to the scarp. The dormant bridge currently visible would not have been added until later. Nicolas Faucherre, a specialist in medieval architecture, produced a detailed plan of this capon sparrow.