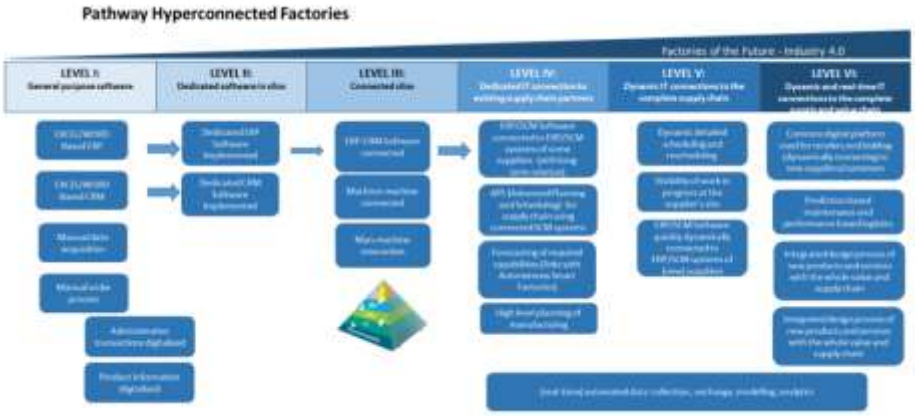
1. Workshop title	**Pathways towards a Modelling and Architecture Language for Interoperable Cyber-Physical Systems**
2. Information about the organiser (s) *Please include name and contact details of each organizer, and indicate his/her relevant background and area of interest.*	**ORGANIZER** Name: Weichhart First name: Georg Organisation: PROFACTOR – Chair of IFIP WG 5.8 Enterprise Interoperability & Chair of IFAC TC5.3 Enterprise Integration & Networking Sector activity: Applied Manufacturing Research Country: Austria Email: georg.weichhart@profactor.at Phone number: +43 664 60 885 355 Research interests and areas of expertise: Interoperability in Complex Adaptive Enterprise Systems Name: Guédria First name: Wided Organisation: Luxemburg Institute of Science and Technology (LIST) Sector activity: Applied Research Country: Luxemburg Email: wided.guedria@list.lu Research interests and areas of expertise: Enterprise Interoperability assessment and maturity Name: Bhullar First name: Gash Organisation: Control 2K – Welsh SME Cluster Sector activity: Manufacturing and Networking Country: United Kingdom Email: gbhullar@control2k.co.uk Research interests and areas of expertise: Manufacturing Name: Panetto First name: Hervé Organisation: Univ. Lorraine -- Chair of IFAC Coordination Committee 5 – Manufacturing and Logistics Sector activity: Applied Research Country: France Email: Herve.Panetto@univ-lorraine.fr Research interests and areas of expertise: Interoperability in Cyber Physical Enterprise Systems
3. Objective of the workshop, goals, content and topics covered	This I-ESA Workshop will serve as a kick-off event to form a task-force on Modelling and Architecture Language for Interoperable Cyber-Physical Systems

	It builds on existing work done within the IFIP and IFAC groups with focus on (Enterprise) Interoperability: ● IFAC / CC 5 - Manufacturing and Logistics Systems / TC 5.3. Enterprise Integration and Networking (http://ifac-tc53.org). ● IFIP / TC 5 Information Technology Applications / WG 5.8 Enterprise Interoperability (http://www.ifip-ei.org/) This workshop is dedicated to consolidating ideas and approaches to form a joint IFIP/IFAC task force, to not only enhance the scientific and application-oriented research of the specific topic, but also to advance Enterprise Interoperability in general.
4. Format (draft) *Number of speaker s/ papers, invited presentations or panels, discussions, debates, Other methods to encourage communication and consensus?* *Duration: half-day*	Authors are expected to submit a short paper (4-6 pages). The paper should contain these elements: ● Vision CPS Interoperability in 2030 ● Contribution of a Modelling Language to reach this ● Requirements on the language to support in reaching this vision ● Systems (not) in focus of the vision ● Pathway(s) to reach this vision ● Systems and roles to which a pathway is relevant ● Milestones / levels showing different degrees of reaching the vision Pathways may be described following the introduction here: https://www.connectedfactories.eu/pathways-digitalisation-manufacturing https://cloud.effra.eu/index.php/s/Ou1cjxbb6TXHmXf Generic Pathways - Example from (EFFRA 2018)  From the same source these examples are given in the following table. *Table 1. Overview of levels in the respective pathways*

Pathways	LEVEL I	LEVEL II	LEVEL III	LEVEL IV	LEVEL V
1. Autonomous Smart Factories	General purpose software	Dedicated software in silos	Connected IT and OT	Off-line optimization	Real-time optimization
2. Hyperconnected Factories:	General purpose software	Dedicated software in silos	Basic internal connectivity	Dedicated IT connection to some supply chain partners	Dynamic IT connection to new supply chain partners
3. Collaborative Product-Service Factories	Product, no Service	Product and disjoint Service	Service-enabled Product Design	Product Service Innovation	Product Service Symbiotic Evolution

	Example Pathways from (EFFRA 2018) Topics to consider for the Language: ● Systemic aspects of Enterprise Interoperability ● Interoperability of Cyber-Physical Systems ○ Physical Parts ○ Cyber Parts ● Systems-of-Systems Interoperability ● Tools for Design of Interoperable Systems ● Tools for Engineering of Interoperable Systems ● Infrastructure Services (Cloud, Fog, Edge) for Interoperable Systems ● Architecture ● Cover Symbolic and Sub-symbolic AI for Interoperable Systems with the Language
5. Publicity *How will the WS be advertised?*	This WS is advertised through the standard means like: contacts in Industry, Standardisation, SME Networks, research bodies like DFG, I-ESA website, industry partners in projects, research organisations and through personal communications. However, the main dissemination channels are the international IFAC and IFIP mailing lists.
6. Audience *How many participants are expected and what is their background?*	We expect about 10 participants from different areas such as industry, standardisation and academic especially with manufacturing and ICT backgrounds.
7. Workshop call for papers (tentative) *with the proposed members of the Program Committee. Workshop organisers have to set up a peer review of the proposed papers*	**PROGRAM COMMITTEE (as of 09.12.2019)** Angel Ortiz Antonio Abreu Asa Fast-Berglund Benoit Iung David Romero Eduardo Portela Santos Francois Vernadat Georg Weichhart Giuseppe Berio Hamideh Afsarmanesh Herve Panetto Ip-Shin Fan Janusz Szpytko Joao Sarraipa Juan Carlos Mendez Luis M. Camarinha-Matos Marek Zaremba Mario Lezoche Michele Dassisti Milan Zdravkovic Nenad Stefanovic Pierre-Yves Schobbens Raul Poler Ricardo Chalmeta Ricardo Goncalves Ricardo Rabelo Rolland Colette Udo Kannengiesser Wided Guedria Yuval Cohen

8. Peer Review process steps	Organisation of Peer Review using easychair Criteria of peer review are the same as for the workshop and publicly announced with at the I-ESA 2020 conference Workshop Organiser gave consolidated feedback of review process. All Final draft papers have been presented and discussed in a Workshop Session at the I-ESA 2020 Comments from this discussion have been incorporated for the Final Paper version of each paper These papers have been double checked by WS organizers and I-ESA Workshop Committee for formatting and plagiarism Additionally, presentations (slides) have been made available on the organizing IFIP WG and IFAC TC homepages.

Please note that Workshop papers must be **no longer than 6 pages.**

A workshop should be planned for 4 hours duration and contain 4-5 paper presentations plus a 30 minutes discussion section. To insure high quality of the papers, the workshop organiser should conduct a peer/expert review of the submitted papers.