Resilient and Sustainable Manufacturing Networks

Aims and scope

Globalization has led more and more companies to organize themselves to interact and collaborate in order to create more efficient value chains providing products and services to customers. In the field of operations management, these organizations are called Manufacturing Networks. They can involve several plants or facilities which can be distributed worldwide and/or belong to one or different firms. Manufacturing network can be defined as a factory network with matrix connections, where each node (i.e. factory) affects the other nodes and hence should not be managed in isolation. More recently, this concept has been extended at two levels. At supply chain level, it has evolved into X-networks or reconfigurable networks, allowing dynamically adaptable and structurally changeable configuration of multiple distributed plants or facilities. At factory level, it has inspired a new way of organizing production systems within the plants or facilities: the so-called Factory Manufacturing Network. It is seen as an evolution of Reconfigurable Manufacturing System (RMS), which is designed at the outset for rapid change in structure as well as in hardware and software components. This also involves flexible intra-logistics in order to quickly adjust production capacity and functionality in response to sudden changes in market or in regulatory requirements.

Manufacturing networks are now facing two new challenges that may seem contradictory. On the one hand, they need to be highly agile and resilient in order to adapt reactively to a constantly higher pace of changes in customer demands and requirements as well as unexpected crisis. On the other hand, they have to consider the long-term consequences of manufacturing processes in order to be more sustainable, which highlight the necessity to integrate the ecological, socio human and economical dimensions of industrial performance.

New digital technologies associated with Industry 4.0 (AI, big data, digital twins, IoT, cobots etc.) open new opportunities in developing smart and collaborative manufacturing networks and in supporting decision making to overcome these challenges. Digital technologies can facilitate collaboration and provide more flexibility, and more real-time information, transforming the way manufacturing networks are defined. Thus, new methodologies, approaches, and knowledge are required to take advantage of the integration of such emerging technologies in order to make them more resilient and sustainable.

This special issue aims to publish innovative research papers focusing on those two main scientific challenges, covering different scales of manufacturing networks: from the whole network at supply chain level to the internal operations of its components at factory level. Both theoretical and application-oriented contributions are welcome.

Topics may include, but are not restricted to:
- Modeling and simulation for resilience and sustainability in smart manufacturing networks
- Performance indicators models for resilience and sustainability
- Governance models to achieve resilience and sustainability in Manufacturing Networks
- Supporting regulations required for resilience and sustainability

- Impact of advanced manufacturing technologies and/or advanced logistics systems on resilience and sustainability
- Advanced digital solutions to support agility or reconfigurability of manufacturing networks
- Human machine collaboration for flexible manufacturing systems
- Reliability of manufacturing networks
- Risk Management in manufacturing networks
- Manufacturing networks for customized product and services
- Achieving Sustainability through flexible or agile manufacturing systems or networks
- Green manufacturing (waste management, resources saving, energy efficiency)
- Impacts of circular economy in manufacturing networks and supply chains
- Manufacturing as a Service to reduce unused production capacity
- Lifecycle performance evaluation of manufacturing systems
- Human well-being in working environments and ergonomic factors in design, planning and control of manufacturing systems
- Human Resources training requirements and methodologies for manufacturing
- Data-driven approaches for resilience and sustainability
- Data economy, Cybersecurity, Blockchain, Data privacy in Manufacturing Networks
- Computing infrastructures and models for systems integration and interoperation in Manufacturing Networks

Submission and Deadlines

Please follow the submission guidelines available on
https://www.springer.com/journal/10845/.
Indicate the title of the Special Issue at the time you submit the manuscript online on Springer website.
Additionally to the online submission, please send a copy to Prof. Xavier Delorme, delorme@emse.fr

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Notification to authors: *15 June, 2022*
Final versions due by: *15 September, 2022*

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