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*Editorial*

# Special Issue "Digital and Sustainable Manufacturing in Industry 4.0"

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The evolution from current to future factories is supported by research contributions in many cross-disciplinary fields, where digitalization and sustainability perspectives are present. Industry 4.0 represents a common framework in accelerated development where those contributions meet to lay the foundation of the coming factories and manufacturing systems [1]. This Special Issue invites novel and high-quality research contributions in a wide range of technologies in addition to papers focusing on the design and operation of manufacturing systems contributing to this evolution. Topics of the Special Issue include, but are not limited to, the following:

- Lean manufacturing in product lifecycles framed within Industry 4.0 [2,3];
- Digitally enabled manufacturing technologies for mass production [4];
- Automation and process integration through collaborative robotics and sensors in production/assembly lines [5,6];
- Flexible routing/scheduling of manufacturing systems for minimum resource use [7];
- Automated quality assurance, traceability, and in-line metrology [8,9];
- Twin green and digital transition technologies and applications [10];
- Circular engineering in the product life cycle [11];
- From lean to human-centered manufacturing science and innovation applications [12].

Manufacturing systems and their integration under triple-bottom-line sustainability criteria (economic, environmental, and social), as well as the research on individual isolated processes and technologies, fit the scope of this Special Issue. Links to factory job shops, including case studies presenting novel and relevant technical/scientific contributions, are welcome.

**Conflicts of Interest:** The authors declare no conflict of interest.

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## References


1. Ghobakhloo, M. Industry 4.0, digitization, and opportunities for sustainability. *J. Clean. Prod.* **2020**, *252*, 119869. [CrossRef]
2. Gil-Vilda, F.; Yagüe-Fabra, J.A.; Sunyer, A. From lean production to lean 4.0: A systematic literature review with a historical perspective. *Appl. Sci.* **2021**, *11*, 10318. [CrossRef]
3. Tortorella, G.L.; Fogliatto, F.S.; Cauchick-Miguel, P.A.; Kurnia, S.; Jurburg, D. Integration of industry 4.0 technologies into total productive maintenance practices. *Int. J. Prod. Econ.* **2021**, *240*, 108224. [CrossRef]
4. Zheng, T.; Ardolino, M.; Bacchetti, A.; Perona, M. The applications of Industry 4.0 technologies in manufacturing context: A systematic literature review. *Int. J. Prod. Res.* **2021**, *59*, 1922–1954. [CrossRef]
5. Andronie, M.; Lăzăroiu, G.; Ștefănescu, R.; Uță, C.; Dijmărescu, I. Sustainable, smart, and sensing technologies for cyber-physical manufacturing systems: A systematic literature review. *Sustainability* **2021**, *13*, 5495. [CrossRef]
6. Calvo, R.; Gil, P. Evaluation of collaborative robot sustainable integration in manufacturing assembly by using process time savings. *Materials* **2022**, *15*, 611. [CrossRef] [PubMed]
7. Fathi, M.; Ghobakhloo, M. Enabling mass customization and manufacturing sustainability in industry 4.0 context: A novel heuristic algorithm for in-plant material supply optimization. *Sustainability* **2020**, *12*, 6669. [CrossRef]
8. Catalucci, S.; Thompson, A.; Piano, S.; Branson, D.T., III; Leach, R. Optical metrology for digital manufacturing: A review. *Int. J. Adv. Manuf. Technol.* **2022**, *120*, 4271–4290. [CrossRef]
9. Moshiri, M.; Pedersen, D.B.; Tosello, G.; Nadimpalli, V.K. Performance evaluation of in-situ near-infrared melt pool monitoring during laser powder bed fusion. *Virtual Phys. Prototyp.* **2023**, *18*, e2205387. [CrossRef]
10. Leng, J.; Wang, D.; Shen, W.; Li, X.; Liu, Q.; Chen, X. Digital twins-based smart manufacturing system design in Industry 4.0: A review. *J. Manuf. Syst.* **2021**, *60*, 119–137. [CrossRef]
11. Acerbi, F.; Taisch, M. A literature review on circular economy adoption in the manufacturing sector. *J. Clean. Prod.* **2020**, *273*, 123086. [CrossRef]
12. Xu, X.; Lu, Y.; Vogel-Heuser, B.; Wang, L. Industry 4.0 and Industry 5.0—Inception, conception and perception. *J. Manuf. Syst.* **2021**, *61*, 530–535. [CrossRef]