

# **Promoting the Development of Additive Symbiotic Networks With the Adoption of Blockchain Technology**

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## **Abstract**

Additive manufacturing has been recognized for its potential to support sustainable production. The literature shows that even though the additive manufacturing industry has proven disruptive potential regarding the incorporation of waste materials as material inputs for its processes, there is a lack of research when exploring industrial symbiosis networks within the additive manufacturing industry (Ferreira et al. 2021) – designated in this research as additive symbiotic networks. This exploratory research intends to promote the development of additive symbiotic networks. Considering the exchange of resources between the different stakeholders that form a symbiotic network, there is a need to find tools that support the implementation of transactions within the network. The blockchain technology has been acknowledged as an enabler to assure trust and transparency of entities and transactions, and thus, it can be used to boost the development of additive symbiotic networks (Gonçalves et al. 2022). Preliminary results from this research tend to confirm that this technology meets the requirements for developing additive symbiotic networks. Despite its potential benefits, adopting the blockchain technology is expected to impact the supply chain structure of an additive symbiotic network, namely in the power distribution among the stakeholders of the network. Future research work is suggested to explore the development of a blockchain-based architecture to support the implementation of an additive symbiotic network. By developing two case studies representing two additive symbiotic networks, this research seeks to revitalize global partnerships for the development and strengthening of global sustainability.

## **Keywords**

Additive symbiotic networks, Blockchain technology, Supply chain management, Sustainability

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## **Biographies**

**Inês A. Ferreira** is currently a PhD student in the Doctoral Program of Industrial Engineering at NOVA School of Science and Technology. She started her PhD in 2019, after she delivered her Master Thesis in Industrial and Management Engineering, focusing on the topic of Industrial Symbiosis Network in the Portuguese Pulp, Paper and Carboard Industry. From 2019 until 2020 she has been invited as Guest Assistant Professor in Stock's Management lectures at NOVA School of Science and Technology. Her research interests mainly concern sustainability, circular economy, industrial symbiosis networks and supply chain management.

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