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20th International Forum on Knowledge Asset Dynamics

Knowledge Futures: AI, Technology, and the New Business Paradigm

IFKAD 2025
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CALL FOR ABSTRACTS – IFKAD 2025

Special Track n.: 51

Thematic Area: AI and Circular Economy

Digital Transformation of Circular Manufacturing Systems

Description

Emerging technologies have been revolutionizing manufacturing extensively for the past decades. However, remanufacturing and circular activities in companies have not been affected by the Industry 4.0 revolution in an extensive volume *(Kristoffersen et al., 2020)*. Moreover, the industry is slowly abandoning linear systems for circular ones *(Guldmann and Huulgaard, 2020)*. However, the evidence shows that when a company engages in circular economy practices supported by information systems capabilities, it positively affects business performance *(Riggs et al., 2024)*. Similarly, digital technologies were supportive of the implementation of circular economy practices *(Neri et al., 2024)*. The usual driver for implementing digital technologies in circular economy practices is costs and not sustainability *(Guldmann and Huulgaard, 2020)*. Therefore, we can ask if companies have not found good business cases to extensively digitally transform circular economy practices or if the technology is not ready yet.

Some emerging technologies were found to enable some aspects of circular economy practices *(see Neri et al., 2024)*. For example, integration between IoT and AI improves disassembly and remanufacturing processes *(Agarwal, Tyagi, and Garg, 2022)*. AI and autonomous robots increase recycling efficiency *(Elghaish et al., 2022)*. AI and big data analytics can support circular process innovation through data analysis *(Liu et al., 2022)*. Yet, we do not see many implementations with high technology readiness that would become widely adopted solutions. Therefore, scientists and practitioners identified the need to transit to Circular Manufacturing Models (CMS), a framework to intentionally design manufacturing systems aiming to facilitate the continuous utilization of products, components, and materials across multiple lifecycles *(Asif, 2017)*.

Considering the scarce practical evidence and lacking maturity in empirical research, this track focuses on studies showing how emerging technologies could support CMS either fully or partially. We do not necessarily look for research encompassing the whole CMS; the studies in this track could include individual circular economy practices such as remanufacturing, refurbishing, recycling, reverse logistics, or improving the circular processes in companies. We look for papers on tools, techniques, factors, or enablers that allow organizations to transform their CMS or its parts digitally. We also look for descriptive case studies that illustrate the cases of digital transformation of CMS or its parts.

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In detail, the track invites both empirical and conceptual research on digital transformation in CMS that will focus (not exclusively) on the following questions:

- How can emerging technologies (e.g., VR/AR, AI/ML, IoT, Blockchain) be used for the digital transformation of CMS?
- What are the enablers, barriers, and critical success factors that affect the digital transformation of CMS?
- What are the (un)successful digital transformation projects in CMS?
- What specific knowledge (if any) is needed for the digital transformation of CMS?

Keywords
Circular Manufacturing Systems, Emerging Technologies, Industry 4.0, Circular Economy, Digital Transformation, Knowledge

Organizers

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Special Track details published on IFKAD website ››

Guidelines

Researchers wishing to contribute are invited to submit an **EXTENDED ABSTRACT** (in editable format) of **min 500 and max 1000 words** not later than 31 JANUARY 2025, using the submission procedure available on the website. The abstract should address theoretical background, research objective, methodology, and results in terms of expected contribution to Knowledge Management theory and practice. Authors are required to follow the guidelines for both extended abstracts as well as full papers available on IFKAD site: www.ifkad.org

Important dates

31 January 2025	*Extended Abstract submission deadline*
24 February 2025	*Acceptance notification to authors*
20 April 2025	*Early-Bird registration cut off*
02 May 2025	*Full paper submission deadline*
31 May 2025	*Registration deadline*
2-4 July 2025	*Conference sessions*

For further information

For any information related to the event, please see the event website at www.ifkad.org or contact the conference manager at info@ifkad.org