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Circular Economy Solutions Transforming Innovation Processes in Manufacturing Industry Ecosystems

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Abstract

Circular economy (CE) solutions represent one key element in achieving the ambitious goals of Twin transition and the Sustainable Development Goals in Europe and beyond [1,2]. Especially when intertwined with the objectives of Green Deal and the related other ambitious European and national policies, these solutions may be perceived as barriers or even inhibitors, as they often challenge the existing technological prospects and business models. This is often the case especially in heavy industrial sectors such as manufacturing industry requiring expensive, long-term and large-scale investments in process or production equipment and facilities.

Additionally, turning the mindset and processes to be in favour of circular economy may also bring disruptive new business possibilities. Furthermore, integrating circular economy solutions into innovation processes requires new, upgraded or updated competences and skills in order to be effectively and efficiently benefitted. Approaches and tools such as Living Labs are the key in designing and implementing CE solutions holistically on production and business levels.

In our approach aiming at supporting integration of circular economy into manufacturing innovation ecosystem we study 3D printing possibilities as part of disruptive solution for wider CE adoption. 3D printing as a feasible and agile production method offers a fruitful playground to innovate and test e.g., bio-based materials and sustainable production. The approach focuses on creating an innovation process with commercial users and research organisations of advanced research and innovation infrastructures and their related service models.

The Living Labs approach emphasizes the engagement of all relevant stakeholders of the



value chain, applying open innovation procedures to all activities, and demonstrators in real-life environments, not just university labs. Specific focus is on SMEs, boosting their competitiveness in the ecosystem. TAMK Knowledge Transfer Charter (KTC) is essential part of the innovation process when enhancing adoption of CE solutions within manufacturing companies [3,4]. Physical platforms for these testbeds are offered via SIXLabs Initiative in Tampere Region. Additionally, the facilities and factories of our industrial partners serve as real-life environments for co-creation.

In this outline we present a case focusing on 3D printing combined with circular economy solutions in manufacturing industry innovation ecosystem. The innovation process builds on learning environment formed by open innovation testbed for hands-on trials and knowledge transfer for ecosystem network. The case investigates and pilots the utilisation of bio-based materials, bridging the gap between new technology early adapters and mainstream manufacturers. Improvement of an integrated knowledge valorisation process is especially essential for SMEs, as they often form the cornerstone as innovators and early adaptors of new technologies. In the meantime, they are still also often struggling with scarcity of resources and agile ways to innovate. The effective inclusion of all the value chain stakeholders in both CE and manufacturing ecosystems enables the effective transformation towards more sustainable and green manufacturing.

Interest group within the Living Labs community are members with high passion towards integration of circular economy solutions into innovation ecosystems of various sectors. More specifically, there is a need for deploying innovation process actions in companies, midcaps and SMEs in traditional industrial sectors where the introduction of CE is utmost demanding but also might have the greatest effects on the Green Transition in the long run.

By presenting and sharing our case we hope to get feedback from the Living Labs community to improve our approach, tools and cases. We look forward to gaining new partners for future collaboration and elaboration of the process jointly with our networks of companies and SMEs in international project contexts.

Keywords

Innovation ecosystem, Innovation process, Living Labs, Manufacturing, SMEs, Circular economy



References

1. Communication from the Commission to the European Parliament, The Council, The European Economic and Social Committee and The Committee of the Regions (2022) 'A New European Innovation Agenda'. COM(2022) 332 final.
2. United Nations' General Assembly Resolution. (2015) A/RES/70/1: 'Transforming our world: the 2030 Agenda for Sustainable Development'. October 2015. UN(2015) A/RES/70.
3. Puurtinen, H.G., Pohjola P., Siivonen J. (2020) 'Co-creative Value Enrichment – Demonstration Environments Leveraging Ideas to Market.' In: The ISPIM Innovation Conference – Innovating in Times of Crisis, 7-10 June 2020. Event Proceedings: LUT Scientific and Expertise Publications: ISBN 978-952-335-466-1
4. Siivonen J., Pohjola P., Puurtinen H.G. (2021) 'Boosting the Unexpected – Industrial Cases revealing Knowledge Transfer Impact.' Accepted in: The ISPIM Innovation Conference – Innovating Our Common Future, Berlin, Germany on 20–23 June 2021 (online). Event Proceedings: LUT Scientific and Expertise Publications: ISBN 978-952-335-467-8

