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Role and Value of Data in Circular Business Models

Systematic Literature Review and Thoughts on Further Empirical Research

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The objective of the literature review was to synthesize what circular business model literature informs about the role and value of data in circular business models. In addition, further research avenues related to the use of various forms of data, such as supply chain and product lifetime data, in circular business models were identified. The research created new insight on transforming data-driven value creation into business and is one of the first comprehensive reviews on the value of data in a networked circular economy context.

The reviewed literature indicates that the state of the understanding on the role and value of data in circular business models is fragmented. However, data and related information technologies, services, and platforms are commonly seen as drivers and enablers of circular economy (e.g. de Mattos and de Albuquerque, 2018; Tura et al., 2019). A variety of business models and strategies including product-service systems, product lifetime extensions, closed loop supply chains, and end-of-life management can take advantage of data in the core of the value creation (see also Bocken et al., 2016). Collaboration in collecting and sharing data as well as efficient flow of information in the supply chain are seen crucial for capturing the value of data in a networked circular economy context (e.g. Brown, 2019; Gupta et al., 2018).

In the use of data, we see a customer-driven path to data-driven circular business models where data is used for enhancing customer experience towards circular economy objectives through product design, product lifetime extensions, higher user involvement, and products-service systems. On the other hand, we see a performance-driven path where data, including real-time and historical performance and material flow data, is used to optimize the economic and environmental performance of circular systems and supply chains.

Further research opportunities identified in this review include increasing the understanding on the role of data as a driver and enabler of circular economy as well as a source of circular business model innovation. In addition, further research should contribute to giving insight on the potential of interorganizational collaboration in capturing the value of data in circular business models and cocreating value with customers. Further empirical research is planned to understand these questions further.

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References

Bocken, N., de Pauw, I., Bakker, C., van der Grinten, B., 2016. Product design and business model strategies for a circular economy. J. Ind. Prod. Eng. 33, 308–320. https://doi.org/10.1080/21681015.2016.1172124

Brown, P., 2019. Why do companies pursue collaborative circular oriented innovation? Sustain. 11. https://doi.org/10.3390/su11030635

de Mattos, C., de Albuquerque, T., 2018. Enabling factors and strategies for the transition toward a circular economy (CE). Sustain. 10. https://doi.org/10.3390/su10124628

Gupta, S., Chen, H., Hazen, B., Kaur, S., Santibañez Gonzalez, E., 2018. Circular economy and big data analytics: A stakeholder perspective. Technol. Forecast. Soc. Change. https://doi.org/10.1016/j.techfore.2018.06.030

Tura, N., Hanski, J., Ahola, T., Ståhle, M., Piiparinen, S., Valkokari, P., 2019. Unlocking circular business: A framework of barriers and drivers. J. Clean. Prod. 212, 90–98. https://doi.org/10.1016/j.jclepro.2018.11.202