

Exploring the Impact of Additive Manufacturing on Circular Economy in the Finnish Boating Industry: An R&D Lab Perspective

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Abstract

In response to the growing attention on Industry 4.0 and Circular Economy within both academic and industrial communities, this study examines the impact of Industry 4.0 technologies, particularly Additive Manufacturing, within the context of the Circular Economy. Focusing on an R&D lab and its endeavours in the Finnish boating industry, the research investigates how these technologies contribute to the adoption of Circular Economy principles. A critical review of extant literature on Additive Manufacturing and Circular Economy was conducted, followed by empirical research using qualitative methods and a case study approach. Data were collected through interviews and supplemented by secondary sources. Findings revealed by a thematic analysis indicate that Additive Manufacturing positively influences the Circular Economy, affecting product design, production processes, environmental sustainability, financial outcomes, and social factors. The study aligns with existing literature and provides practical recommendations for manufacturers, along with suggestions for future research avenues.

Keywords: Industry 4.0, Additive Manufacturing, Circular Economy, R&D Lab