

CRITICAL FACTORS FOR THE ADOPTION OF ADDITIVE MANUFACTURING IN SPARE PART SUPPLY CHAINS: INSIGHTS FROM AN INDUSTRIAL COLLABORATION WITH THE NAVIGATOR COMPANY

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Summary: Spare part supply chains often face challenges related to long lead times, high costs, and inefficiencies associated with centralized manufacturing and traditional production methods. Additive Manufacturing (AM) presents a disruptive opportunity to address these inefficiencies by enabling localized, on-demand production, reducing material waste, and improving spare part availability. This is particularly relevant in process industries, such as paper and pulp, in which the downtime is extremely expensive. This paper explores the critical factors influencing the implementation of AM in spare part supply chains, leveraging insights from a collaboration with The Navigator Company. Through unstructured interviews with industry experts, key challenges and opportunities were identified, including the irregular demand for spare parts, the limitations of conventional supply chains in terms of obsolete components, excessive costs, and unreliable lead times, and the potential of AM to enhance material efficiency and decentralize production. A structured framework was developed to assess drivers and barriers across technological, environmental, social, and economic dimensions. The findings highlight that while AM has the potential to transform spare part logistics, however, successful adoption depends on material availability, process optimization, and integration with existing supply chains. This research contributes to the ongoing discussion on sustainable and resilient supply chains.