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Research article

Additive Manufacturing: Application Perspectives in Small and Medium Enterprises

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Abstract Changes in customer expectations, markets and organisations are creating an increasing need for customised products and calling for reactive supply chains. New technologies might help organisations to deal with these challenges in a flexible and cost-effective way. One of these technologies is Additive Manufacturing (AM). The object of this paper is to outline the potential of AM in production, to identify possible supply chain developments and to determine the role that SMEs might play in this scenario. In detail, we pose the question whether AM might lead to geographically dispersed manufacturing plants and might replace physical material flow with information flow and how SMEs can act in this development process. Based on an exploratory literature review, we highlight the market requirements addressed by AM, the supply chain characteristics for AM and the role of SMEs. Implementing AM can cause shifts in the decoupling point as well as changes in the global supply chain configuration (relocation of production closer to the final customer). We then conduct some expert interviews, which confirm some of the results of the literature review, but emphasise that AM will not replace conventional manufacturing processes on a large scale, at least in the medium term.

Keywords: Additive manufacturing, 3D printing, Industry 4.0, Manufacturing systems, Supply chain design

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