29 JUNE - 3 JULY
ACEX2026
RHODES . GREECE

19th International Conference on Advanced
Computational Engineering and Experimenting
29 JUNE – 3 JULY 2026 | RHODES, GREECE

ABSTRACT:

Agile Design for Direct Manufacturing : Realising Additional Potential of Additive Manufacturing through Agile Product Development

A. Koch[1], F.J. Günther[1]
[1]University of the Bundeswehr Munich, Werner-Heisenberg-Weg 39, 85577 Neubiberg, Germany.

The industrialisation of additive manufacturing (AM) is not only driven by technological and materials science progress but also fundamentally depends on manufacturing companies' ability to translate technological potential into market-ready products. Considering rapidly evolving markets and dynamically changing customer demands, companies' competitiveness is increasingly defined by their capacity for fast adaptation. Under these conditions, agile development methodologies are gaining attention as promising alternatives to traditional plan-based approaches in hardware development. However, adopting agile principles presents a unique set of challenges for manufacturing companies, particularly due to the physicality of the products and high specialization of development units. This presentation investigates the relevance and applicability of agile development methodologies in the context of direct manufacturing. We conducted a survey involving 34 professionals from international companies actively utilizing AM in their development and production processes. The participants evaluated the adaptation of core agile principles specifically tailored for direct manufacturing. Our analysis reveals that most respondents consider agile-inspired development approaches to be well-suited for tackling current industry challenges in product development both with and for AM. Notably, stratified analysis by professional group and challenge awareness exposes varying degrees of acceptance and alignment with agile work practices. The results highlight key enablers for agility within AM-driven product development and underline the technological-methodological synergies between AM and agile principles. These insights allow us to formulate practical recommendations for enhancing flexibility and efficiency in the development of series products manufactured additively. Ultimately, the study contributes to a deeper understanding of how agile methodologies can be leveraged to maximize the innovative and commercial opportunities unleashed by additive manufacturing.