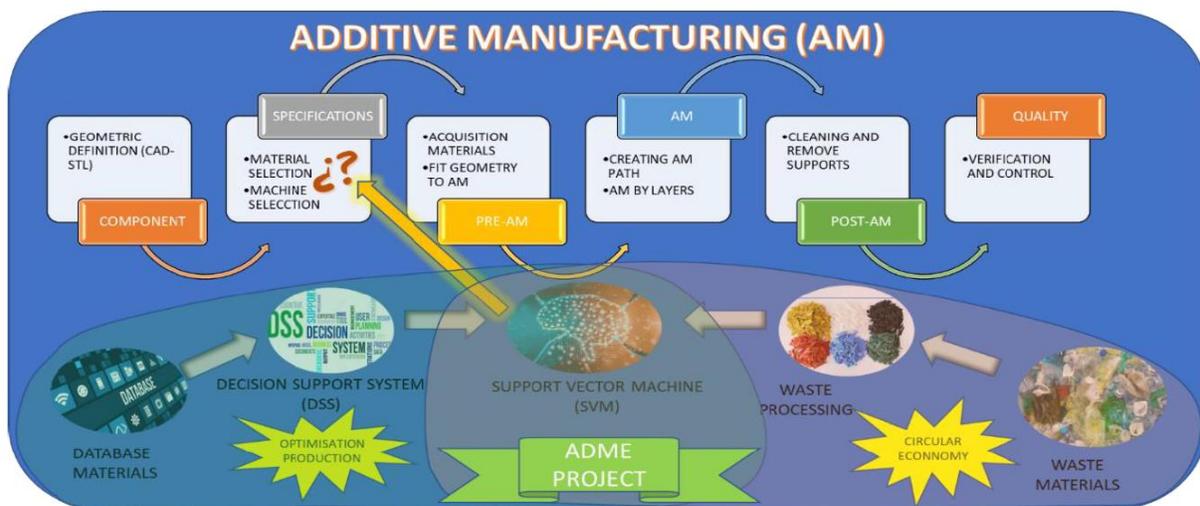


ADME, DDS with AI-based Criteria Optimizer for Additive Manufacturing

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Critical to the selection material requirements for additive manufacturing (AM) is the necessity for appropriate materials. Materials requirements for AM comprise the ability to produce the feedstock in a form in accordance with the specific AM technology. ADME project presents an innovative solution to resolve the designer efforts of material selection of the heterogeneous properties of composite materials based on the development of novel software.



The main limitation of the AM process, in the industrial applications, is the uncertainty about manufacturing conditions, material selections, component properties related to the applied machines and costs. Having large range of processes, materials, machines are available on the market, getting the optimal configuration for the specific customer part is often challenging. AM is performed applying different design and manufacturing phases; starting by geometry definition till quality, passing through design specifications, as can be observed in the figure. To facilitate the design process and to support the respective customer in production planning, Support Vector Machine (SVM) is proposed, which provides an estimation of manufacturing conditions of AM technologies, considering new and waste materials. The system consists of a database, which includes data about available materials and machines.

The main objective of the project is to help designers demonstrating the potential of intelligent Decision Support System (DSS) tool, based on SVM. The tool will reduce time to market of the product, helping designers to save searching materials on material handbooks and provides optimized software for the best selection of composite materials, also considering recyclability of materials. As a result of the ADME project, the user can evaluate the influences of his decisions concerning design, material and machine selection at an early stage of the product development process.

This will increase the production efficiency of additive manufacturing, across a decision support device for the selection of suitable material, and the use of circular economy, using recycled materials as manufacturing inputs.

The specific objectives of ADME project can be summarized as follows:

- Arrangement and Generation of a database of AM inputs (materials and machines).
- Creation of the SVM algorithm for selection of the best input that meets the specifications.
- Obtaining inputs for AM from waste materials (focusing on different types of polymers).
- Integration of the SVM in a DSS with a friendly GUI (Graphics User Interface).

Project Partners:

SMASP REDES PROFESIONALES, S.L - <https://smasp.org/>

FAVORITANSWER LDA (trading as FAN3D) - <https://www.amfan3d.com>

Website of KYKLOS 4.0 - <https://kyklos40project.eu/>

Information on ADME - <https://kyklos40project.eu/about-kyklos/funded-experiments/>

