

Additive Manufacturing for a sustainable industry of the future

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1. Future of Industry and Additive Manufacturing

Additive Manufacturing, commonly known as 3D printing technology, is more than 40 years old and has been blocked for years mainly by patents, which are now extinct. Today the growth of applications, technologies and materials is predicted to be continuous and unstoppable. New materials and technologies and advances as Zero-defects manufacturing systems or real time control / monitoring systems are being developed and appears as the trends to implement in the following years. ¹These will change conventional design and manufacturing concepts and processes as well as new businesses, companies and jobs around the world.

Additive manufacturing (AM) has become one of the key strategies towards the transition to a digital and green Europe. It has already changed our lives and will continue to do so in the future. From the point of view of product development, it is allowing us to conceive single piece products that traditionally were a set of parts to achieve the same function. It also allows the reduction of launching times, as well as the versatility and customisation of products dedicated to a final function.

In general, for industry, it means a revolution that perfectly connects digitalisation and the optimisation of the consumption of raw materials. As far as people are concerned, it represents an opportunity to improve the quality of life both in its application in external medical uses (e.g.,splints, prostheses, utensils and tools for operations and cell cultures, protective elements such as helmets, safety and ergonomics such as exoskeletons) and in internal uses (e.g.,mainly prostheses and organs, etc.), as well as in their daily lives (e.g.,cars, sports equipment, fashion, etc.) or by becoming creators of their own objects.

Automation and robotics are key technologies for industry in order to regain manufacturing hegemony. The democratisation of robotic applications is one of the priorities, which includes the training of personnel and the promotion of more accessible technologies. Particularly important is the integration of additive manufacturing processes with robotics, to develop, for example, metal and polymer AM systems for the manufacture of large parts, covering applications that were until now unattainable, such as: demonstrators in transport, aerospace and equipment sectors, as well as in the manufacture of machines and tooling.

¹ <https://skills4am.eu/documents/D4.5.1%20Report%20VF.pdf>

When analysing the job market for additive manufacturing, it can be seen that in 2021 there were 30% more job vacancies in the AM industry in same specialized websites². In Spain alone, more than 500 companies are looking for professionals with the skills to work with 4.0 technologies. Undoubtedly, one of the challenges these companies face is finding trained and experienced professionals in additive technologies; hence the importance of having a solid training based on practice. The enormous growth of AM will continue to require specialised training to fill the positions that this emerging industry will need in the future.

It is very important to train different types of profiles to apply AM in their field of work. They need to be aware of the possibilities of these technologies to be able to apply a strategy in their company that will enable them to differentiate themselves in an increasingly competitive market, which is why training must include everything from design to manufacturing and to start from a basic level, which allows workers familiarize themselves with the technologies and learn about their possibilities up to a more specialized level, focused directly on the needs that each company wants to solve through AM.

Training activities are still very focused on traditional manufacturing methods. Additive manufacturing breaks with traditional processes and many of the traditional subjects, such as design or calculation, are not prepared yet for AM manufacturing. To solve this, a basic training is needed, but currently it is not being provided by traditional training courses. Hence the importance of good initial training, with practical content in alignment with a market demand of increasingly qualified professionals. In the long term, it is also essential to broaden the perspective and influence the need for training in AM from the early educational stages, from infants and primary schools to later progress to vocational training centers and universities, as well as to professionals. Actions of this raise awareness type, focused on various audiences, are carried out in reference projects such as SAM.

In this context, it is essential to propose new sustainable developments and advanced digital processes, so that they are transferable to national and European level and above all, that it favours their incorporation in SMEs. The main objective must be to modernise and adjust the industrial network to the needs of the future. Adequate training is essential for this.

² <https://www.3dnatives.com/en/3d-printing-job-market-trends-in-2021-030220224/>

2. About SAM Project

More information about the SAM project can be found on the project homepage: www.skills4am.eu. Join us by supporting the SAM project to identify current and future qualification requirements as well as participating in workshops to shape education and training for AM throughout the EU. You can get involved in different ways, for example through participation in workshops to support the identification and validation of qualification requirements and the development of competence units; in the implementation of training courses and dissemination of project results; and also, through participation in the information campaign for students and professionals. Contact details and more information on how you can get involved as an associated partner can be found here:

<http://skills4am.eu/associatedpartners.html>



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