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TECHNICAL INNOVATION AND GLOBAL INDUSTRIAL PERFORMANCE: THE CASE OF 3D PRINTING

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Additive manufacturing (better known as 3D printing) refers to software-driven processes that manufacture objects through the successive depositing of extremely fine layers of material that are then made solid by means of an energy source. This enables accurate and complex shapes to be formed directly and only uses the amount of material that is strictly necessary, as opposed to traditional "subtractive" methods.

Although it is still too early to gauge exactly what role this **digital technology** will play in economic activities, it does seem to offer considerable potential, and, based on continuous progress being made both in terms of the performance of machines and the variety of materials that can be used, it is already certain that it will be indispensable in many sectors, such as health, aeronautics and space, jewellery, food and the construction and civil engineering sectors. The most fascinating possibilities are already beginning to emerge, for example with the huge potential offered by the use of biological tissue.

Clearly, France cannot allow this opportunity to pass it by and must encourage its production base to fully embrace this innovation . The recommendations made by the ESEC seek, accordingly, to boost our advantages in terms of software, services and materials, and to address certain weaknesses, particularly in the areas of training, research and financing.

This opinion also highlights certain issues common to all digital technologies that have **considerable potential to challenge the current model of production**. What they share is the fact that they profoundly alter the nature of products and services (from mass-production to bespoke production) and the location of production (with promising prospects for the development of local activity), and that they cause new actors to emerge in the chain of production and radically alter the organisation of labour (which becomes more collaborative).

Taking 3D printing as an example, the ESEC advocates that the public authorities and all economic and social actors in France should seize upon what the technology has to offer in order to improve the global performance of the French economy and prepare it for "**the factory of the future**".

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ESEC PROPOSALS

Find out more about 3D Printing

- by getting forecasting analyses ordered by the public authorities, the National Council for Industry and the National Services Commission.

Develop training and qualifications

- by giving young people an appetite for science and innovation by learning IT skills and by using 3D Printers from the age of five.
- by creating 3D training centres of excellence at all levels: engineering schools, specialist training in service sector activities such as logistics, commercial, legal and at the URMA (Regional University for Trades and Crafts).
- by adapting ongoing training to new trades associated with a technological awakening. The ESEC wishes to highlight the particular role of professional organisations and chambers of commerce.

Step up research and development efforts

- by encouraging research in public laboratories and by fostering partnerships between public sector research and innovative businesses.
- by fostering synergies between bodies responsible for the commercial development of research through the creation of a reception counter accessible to businesses.

Scale up the financing of innovation in France

- by improving public support. Bpifrance must possess sufficient resources to be able to sustain its efforts in the long term. The ESEC recommends encouraging long-term savings products to focus on innovation.
- by inviting the banking sector to build up a relationship of trust with SMEs.
- by encouraging local governments to work together with local partners to launch innovation financing funds.
- by making optimal use of EU financing and of the "Horizon 2020" programme. The ESEC wishes to stress the need to improve support of SMEs in preparing these financing applications.
- by structuring long-term research through "investments for the future".

Address the new intellectual property and security challenges

- by making businesses aware of new risks, with an advisory role being played by chambers of commerce alongside professional bodies.
- by securing the legal landscape for businesses. The ESEC takes the view that intermediating platforms ought to be made clearly liable to provide them with an incentive to control the legality of the files they host.
- by taking into account environmental and health impacts. The ESEC wishes to draw the attention of actors to the importance of compliance with current legislation concerning materials, equipment and their usage.

Play a greater role in international standards-setting processes

- by keeping the standard-setting process under ISO in place, allowing for challenges between national or regional standards bodies.
- by involving French businesses extensively in dedicated standards committees. The ESEC would like to see greater use made of this tool for helping SMEs to participate in standards-setting.

Foster the emergence of activities and jobs in the territories

- by clarifying and accelerating the 34 industrial plans linked to technological innovations and specifically the "factory of the future" plan.
- by developing new production units in the territories as part of a global transition towards a more circular economy. Additive manufacturing is a technology that is well-suited to the development of a maintenance and repair sector.
- by commercially exploiting the advantages of French software and new materials businesses (metals and alloys, organic materials).
- by drawing upon aspirations towards independence and collective creativity to make businesses more human and more appreciative of the value of work.

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