Creating the foundation of qualifications for long-term success of additive manufacturing

European Federation of Welding, Joining and Cutting leading with a pilot project to align qualification with European Qualifications Framework and modular approach to its system

The digitization of the manufacturing sector heralds the beginning of the Fourth Industrial Revolution, laying the foundation for an all-encompassing transformation. One of its pillars is Additive manufacturing, which will change qualifications in three levels – manufacturing technologies, control systems and digital technologies, as trends such as the Internet of Things and connected machines become pervasive. To ensure that the workforce is ready to embrace the challenge and drive the industry forward, reskilling, retraining and developing new qualifications are all of paramount importance.

Addressing these new trends and opportunities, the European Federation for Welding, Joining and Cutting (EWF) will developed a modular approach to its qualification system, enabling professionals to pick and choose the most adequate qualifications to achieve the required certification, thus enabling further flexibility on the workforce in response to changing industry's requirements.

A lighthouse project has already been started to align the Welding Qualification System to the European Qualification Framework (EQF). It is a result of the recognition of the success of EWF's harmonised qualification system for personnel involved in the welding, joining and related technologies. The results can then be used for benchmarking with other areas, namely from the manufacturing sector, as an operational guidance document will be designed for the purpose, defining a path for other systems to follow. But, if anything, the pace of change is accelerating, with the related quick obsolescence of qualifications, which in turn will make lifelong learning ever so important and make online learning tools pervasive, namely the MOOC (Massive Open Online Courses).

In summary, a fast-changing workforce profile is underway and companies, universities, training institutions and governments must work together to address them, by aligning formal and informal qualifications, adding flexibility to the curriculums, and not only allowing but embracing lifelong learning in all its dimensions. EWF and its members want to be at the forefront of that change, ensuring the industry has the most qualified professionals to meet its challenges.

Addressing Additive Manufacturing's workforce disruption

Consulting firm McKinsey describes the Fourth Industrial Revolution as the next phase in the digitization of the manufacturing sector, driven by four disruptions: the rise in data volumes, computational power, and connectivity; analytics and business-intelligence capabilities; human-machine interaction; and improvements in transferring digital instructions to the physical world. Taken together, they will lay the foundation for a revolution more comprehensive and all-encompassing than anything we have ever seen. In the near future, they may transform the economics of global production in many industries, as smart systems—homes, factories, farms, grids or cities—will help tackle problems ranging from supply chain management to climate change.

One of the pillars of this revolution is additive manufacturing that is currently used in smaller scale but which has within manufacturing its most significant and lasting commercial impact. Several hurdles need to be overcome in order to achieve a full utilization of additive manufacturing in most industrial scenarios, from parts size and resistance to the ability to mix materials in one production run and, last but not the least, the qualification of personnel able to use these technologies. And the World Economic Forum has assessed just that in a recent document. Looking at the core curriculum content of many academic fields, WEF's study highlights that nearly 50% of subject knowledge acquired during the first year of a four-year technical degree is estimated to be outdated by the time students graduate. Which, in fact, means that any assessment made today needs to take into consideration the fact that a large share of the subject knowledge of the current workforce will be outdate in just a few years. Secondly and, on average, by 2020, more than a third of the desired core skill sets of most occupations will be comprised of skills that are not yet considered crucial to the job today, according to the respondents of this report.

That change is pervasive and will be felt in all areas, going from the most traditional jobs to the highest qualified technical jobs. Industry 4.0 will bring added change given the compound effect of its pillars on each other. And in keeping up with the tradition of moving in tandem with the evolution of industry since 1992 with its harmonised qualification system for personnel involved in welding, joining and related technologies, EWF is already responding by adapting its system to current and future industry requirements.

Beyond that, skills and qualifications transferability are a key requirement for the future. The two pillars of knowledge acquisition are the traditional education systems learned at Universities and the technical training given for specific jobs. The current disconnect implies that a qualified technician will not have its qualifications recognized in the traditional education system, which basically means that transferability of knowledge is not effectively being applied, hinders industry's growth and creates unnecessary barriers to improve workforce qualification.

In summary, in order to ensure that the future workforce is prepared for the challenges of industry 4.0 and, specifically of Additive manufacturing, there is a need to facilitate retraining and reskilling; to ensure transferability between traditional education systems and technical education; to integrate modularity on the qualifications systems; and, lastly, to align industry's qualification systems with the European Qualifications framework, hence ensuring a more qualified and mobile workforce within EU.

About the European Federation for Welding, Joining and Cutting

EWF is a pioneer in implementing a harmonized qualification and certification system for joining professionals. Through European projects EWF has been innovating in training methodologies, and involved in the development of new technologies and uses for joining. Through its member organisations, EWF has established a firm link to the local industry, providing knowledge and training as well as participating in research initiatives that address the most pressing questions and challenges in the field of joining technologies.

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