ONTOLOGIES AS A MULTIDISCIPLINARY APPROACH TOWARDS DATA AND SOFTWARE INTEROPERABILITY IN APPLIED SCIENCES

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In recent years there has been an increasing need for a better knowledge management in the applied sciences and industrial domains. The existence of large amount of unexploited data and the difficulties to understand, categorise and propagate such data from one domain of expertise to another is a barrier towards effective data sharing and data-driven innovation. Moreover, the lack of truly multidisciplinary platforms and methodologies that facilitates the connections between domain experts is preventing fruitful reuse of approaches and tools, acting as barrier towards cross-domain interoperability. Investigating new approaches to knowledge management to overcame such limitations requires to approach the problem through many different perspectives, questioning the traditional ways and the fundamental approaches that domain experts used up to now to deal with knowledge generation and sharing.

Ontologies (i.e. the formalization of knowledge through a logical framework) may play an important role to improve actual approaches to knowledge, being the basis for the development of interoperability framework and the gateway for human-to-machine and machine-to-human interactions, pushing towards a human centred digitalization effort. However, it is important to understand both the opportunities and the limitations of such approach and the ways in which ontologies can be used in practice to reach a factual knowledge interoperability.

After a brief introduction to ontologies, this talk will show some of the practical approaches that are actually investigated in several H2020 projects, underlining the ambitions, the current achievements and bottlenecks, following the perspectives of the European Materials Modelling Council (EMMC) and of the Elementary Multiperspective Material Ontology (EMMO), currently in development.

Keywords
Ontologies, Interoperability, Data, Industry 5.0.

References
[1] G. Goldbeck et al., "A Reference Language and Ontology for Materials Modelling and Interoperability", NAFEMS World Congress (2019).
[2] The Elementary Multiperspective Material Ontology (EMMO).