CIVIL AND ENVIRONMENTAL ENGINEERING

MUR DM 117/AI Engineering - BIM, VPL and VR for projects of infrastructures starting from the contents of FM

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Context of the research activity	The aim of this research project is the definition of standards related to graphic (LoG) and information (LoI) content of complex hydraulic infrastructures using a top-down "design with the end in mind" approach, using advanced Building Information Modeling tools (BIM), Visual Programming Language (VPL) and Virtual Reality (VR) for the definition of a Digital Twin (DT) for Facility Management (FM). Progetto finanziato nell'ambito del PNRR - DM 117/2023 - CUP E14D23001990004
Objectives	The methodological approach includes the following phases: (i) identification of essential data for management and maintenance; (ii) setting of the BIM As-Designed model also containing the correct use of the LoG and LoI typical of the FM for an optimization of the design choices also in terms of environmental sustainability; (iii) specification of the Level of Reliability (LoR) of the information relating to the sub-services for a correct planning definition on the territory; (vi) use of the typical parameters of the 4D (times) and 5D (costs) to control the progress of the works in relation to the necessary Work Progress Statuses (SAL); (v) definition of the contents of the BIM As-Built model; (vi) clarification of the contents of the BIM As-Is model. At the end of the work, the DT will be able to integrate the As-Is model with static and dynamic data and will allow the visualization of the information also in VR for the training of the personnel assigned to the FM of the infrastructure and of the more significant and complex components. The above procedure can be tested within some real case studies, such as for example in the construction of the Pescara aqueduct or in the Beer Sheva purifier project in Israel.

Skills and competencies for the development of the activity	Ability to model complex infrastructure using BIM tools