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Evolutive Digital Twin Applied to Nuclear Industry

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The Digital Twin (DT) is the most advanced paradigm to create a virtual representation of a real world multi-physical system for the sake of designing, monitoring, and supporting the decision making throughout its whole lifecycle. Therefore, DT requires a flexible ecosystem made of a variety of engineering tools and services that need to be highly interoperable and enable knowledge management and traceability. However, the major challenges that slows down the emergence of DT environment are the inherent incompatibility of engineering tools with the absence of a unified standard for interoperability, and the human change aversion to new technologies, tools and paradigms. For this purpose, we have developed an evolutive environment that answers the main requirements of Interoperability, Traceability, Flexibility, and Knowledge management. In this paper, we introduce a general overview of DT ecosystem with the limitation of some state-of-art existing implementations with respect to four metrics. Then we will introduce our solution applied to a nuclear case study to demonstrate a highly evolutive implementation of a DT ecosystem.

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