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SQAaaS as the quality gate for Digital Twins

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In this presentation we will outline the role of the SQAaaS platform as the architectural building block for quality assurance (QA) within two ongoing EC-funded projects that are prototyping Digital Twins in diverse scientific domains: DT-GEO and Intertwin.

The individual requirements of each project have shaped the SQAaaS platform to be a flexible engine that is able to evaluate both the individual digital objects produced and consumed by the Digital Twin, i.e. datasets and software, as well as the workflows that control its operation.

Consequently, the SQAaaS platform is being extended to integrate with an increasing number of platforms and tools used by the use cases in the framework of these projects. These range from code hosting platforms (e.g. GitHub and GitLab), (meta)data repositories and catalogs (e.g. EPOS data portal), to tools and standards for workflow management (e.g. CWL, PyCOMPs, PyOphidia). We will describe the integration efforts done to guarantee that the SQAaaS successfully reacts, and thus the quality checks could be triggered, to varying circumstances such as (i) changes in the workflow code hosted in GitHub, (ii) CRUD operations in (meta)data hosted at (meta)data repositories, and (iii) QA checks embedded in the workflow execution.

The range of QA checks in the SQAaaS platform provide both comprehensive and on-demand assessments. On the one hand, generic QA checks include FAIR evaluation of data, and software QA characteristics verification and validation of code and services. More are expected in terms of FAIR-related checks for software, and data quality evaluation. On the other hand, on-demand checks are those currently done for the workflows, including validation of workflow specification and execution. Here as well, new capabilities are being considered such as data provenance-related checks.

In-place and near future features of the SQAaaS platform, resulting from the 2-year of work within DT-GEO and Interwin projects, are shaping the platform as a key building block in the engine of interdisciplinary Digital Twins by providing a valuable range of QA-related checks that contribute to their successful operation.

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