AI, Automation & Optimization

Thu. Nov 12, 2026 2:00 PM - 3:30 PM JST | Thu. Nov 12, 2026 5:00 AM - 6:30 AM UTC | Room C (201) (2F)

Oral C2 AI, Automation and Agent Platform

Chair: Patrick Heimbach, Fernando Mendez

2:00 PM - 2:15 PM JST | 5:00 AM - 5:15 AM UTC

[GdsyDt6e-01] MeDITTO: An AI-Agent Platform for Interoperable Digital Twins of the Ocean

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Developing regional Digital Twins of the Ocean (DTOs) requires architectures integrating heterogeneous, distributed digital assets into actionable knowledge accessible to users with different levels of expertise. Building on more than 17 years of experience operating observing and forecasting systems, the Balearic Islands Coastal Observing and Forecasting System (SOCIB), in collaboration with Blue Lobster IT, is developing MeDITTO “Mediterranean Digital Twins of the Ocean”, a pilot within the SOCIB2030 strategic framework. This contribution presents MeDITTO, highlighting its agent-based orchestration, multimodal user interaction and distributed integration capabilities. We discuss key architectural choices, lessons learned, and pathways towards a scalable, secure, modular and interoperable framework for federating DTOs.

MeDITTO provides a unified platform to seamlessly discover, compose and execute DTOs, services, data, products, models and knowledge across regional and global ecosystems. A multimodal interface combines conversational natural-language interaction with interactive maps and visualisations, featuring a clear, intuitive design tailored to users with different levels of expertise and needs. It enables them to formulate complex questions and progressively explore and refine results through visual analytics. An orchestration layer coordinates specialised AI agents to discover available capabilities, invoke federated services, manage execution across hybrid cloud HPC infrastructures, and aggregate results using provenance-aware workflows. This agent-based approach keeps individual DTOs modular while communicating through a common interaction layer. MeDITTO will also provide a marketplace that interoperates with external DTO ecosystems such as EDITO and DITTO.

MeDITTO builds on SOCIB's active participation in European initiatives, particularly the EDITO Model Lab, adopting interoperability principles aligned with the European ecosystem. Integration with Destination Earth Data Lake is also being explored to test distributed access and execution workflows across heterogeneous infrastructures. Together, these developments and collaborations provide a testbed for evaluating scalability and standards-based integration approaches for hybrid infrastructures, connecting regional digital twin capabilities with broader European and global DTOs.

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