ODYSSEA: A novel, interoperable platform for products and services in the Mediterranean Sea – System Architecture and Design

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Introduction

ODYSSEA (http://odysseaplatform.eu/) is an EU H2020-funded project aiming to develop, operate and demonstrate an interoperable and cost-effective platform that fully integrates networks of observing and forecasting systems across the Mediterranean basin, addressing both the open sea and the coastal zone.

The project involves 28 partners (universities, research centres, international organizations, NGOs and private companies) working systematically towards the development of the ODYSSEA platform to:

- Integrate marine data from existing databases maintained by Earth Observing facilities, scientific networks, agencies, public authorities, and institutions of Mediterranean EU and non-EU countries (CMEMS, GEOSS, GOOS, EMODNet, ESFRI, Lifewatch, Med-OBIS, GBIF, AquaMaps, Marine IBA e-atlas, MAPAMED and others with marine and maritime links);
- Receive and process novel newly produced datasets (through models, remote sensing and on-line sensors) from nine prototype Observatories, established along the continental shelf of the Mediterranean Sea, especially at areas with intense human activity but also at marine protected zones;
- Transform marine data into meaningful information, ultimately developing, testing, validating and disseminating marine data products and services to end-users and stakeholders from a diverse spectrum of marine and maritime sectors (mariculture, shipping, oil and gas exploitation, port management, civil protection, etc).
- Stimulate Blue Growth throughout the Mediterranean basin, creating businesses, advancing science and supporting the societal use of digital information.

When operational by 2021, the final platform will provide easy discovery and access to marine data and derived products to a variety of users to improve knowledge and decision-making capabilities in the Mediterranean.

ODYSSEA Platform Novelties

As a platform, the ODYSSEA system will encompass and offer to its users a series of novelties classified as service-level, platform-level and information-based novelties. In terms of service-level innovations, ODYSSEA platform will provide the capability to search and retrieve marine data, but also to deliver products and services built upon the existing datasets. In terms of information-based novelties, ODYSSEA platform will aggregate physical, chemical, geological, biological, biodiversity and fisheries datasets through ontology approach and semantic information fusion to provide functionalities and services.

The set-up of the platform will allow the use of agile methods enabling short loops between user's feedback and the development team. The platform will be fully decentralised, event-driven and easily

deployable on a cloud system for big data processing (e.g., DIAS) thanks to docker and kubernetes technologies.

ODYSSEA Platform Architecture

The ODYSSEA platform is designed to be expandable, scalable, flexible, transferable and interoperable. The main elements and components of ODYSSEA platform are illustrated in Figure 1, involving: a) the Data Collection Component; b) the Data Pre-processing Component ; c) the Data Storage Component ; d) the Post-processing Component ; e) the Product Factory Component ; f) the Authentication and User Management Component ; g) the Cataloguing Component ; h) the Data Output and User-Interface Component.
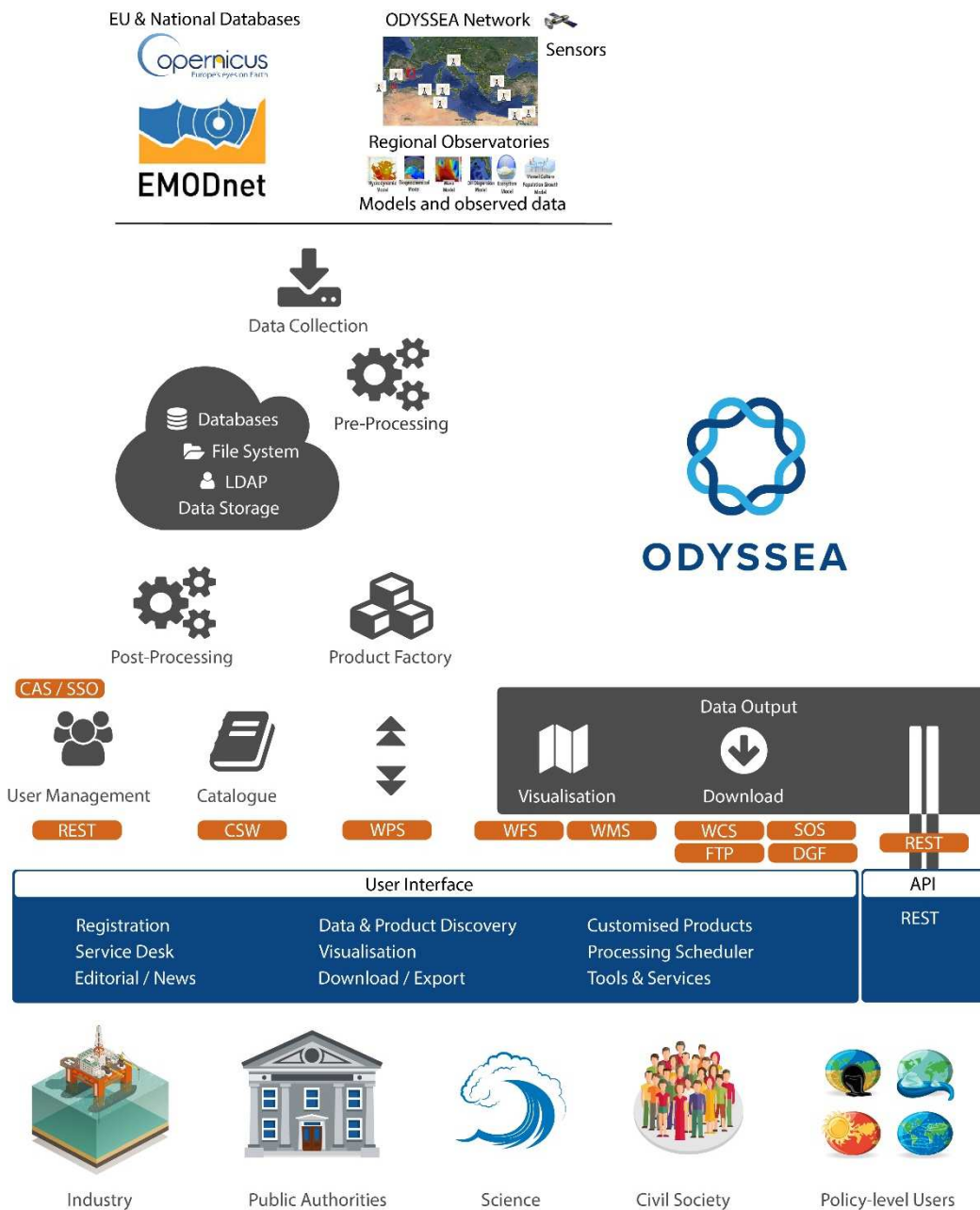

Figure 1. ODYSSEA Platform Architecture.