

# PLATFORM DEVELOPMENT

RV1 Review Meeting, Brussels

Ghada El Serafy, Adelio Silva, Noam Miron, Nicolas Granier, Simon Keeble

Deltares



This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 727277



# PLATFORM DEVELOPMENT - USER SERVICES

RV1 Review Meeting, Brussels

*Ghada El Serafy*

Deltares

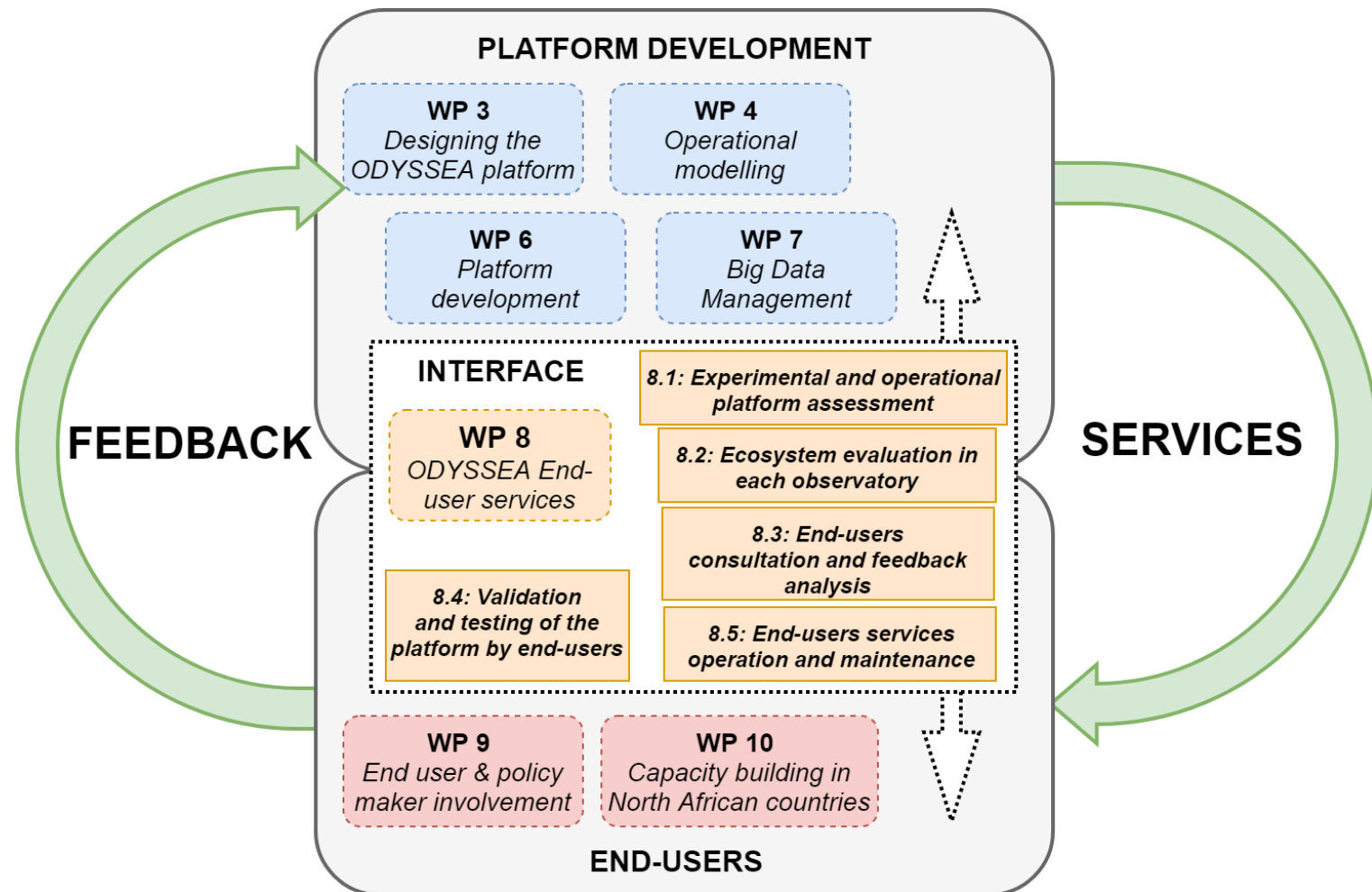
Ghada.ElSerafy@deltares.nl



This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 727277



# Interfacing platform and users





# Generating Services in ODYSSEA



ODYSSEA



## WP6

Platform  
Development,  
Operation and  
Maintenance



## WP7

Big Data  
Management  
and Tools  
Development



## WP8

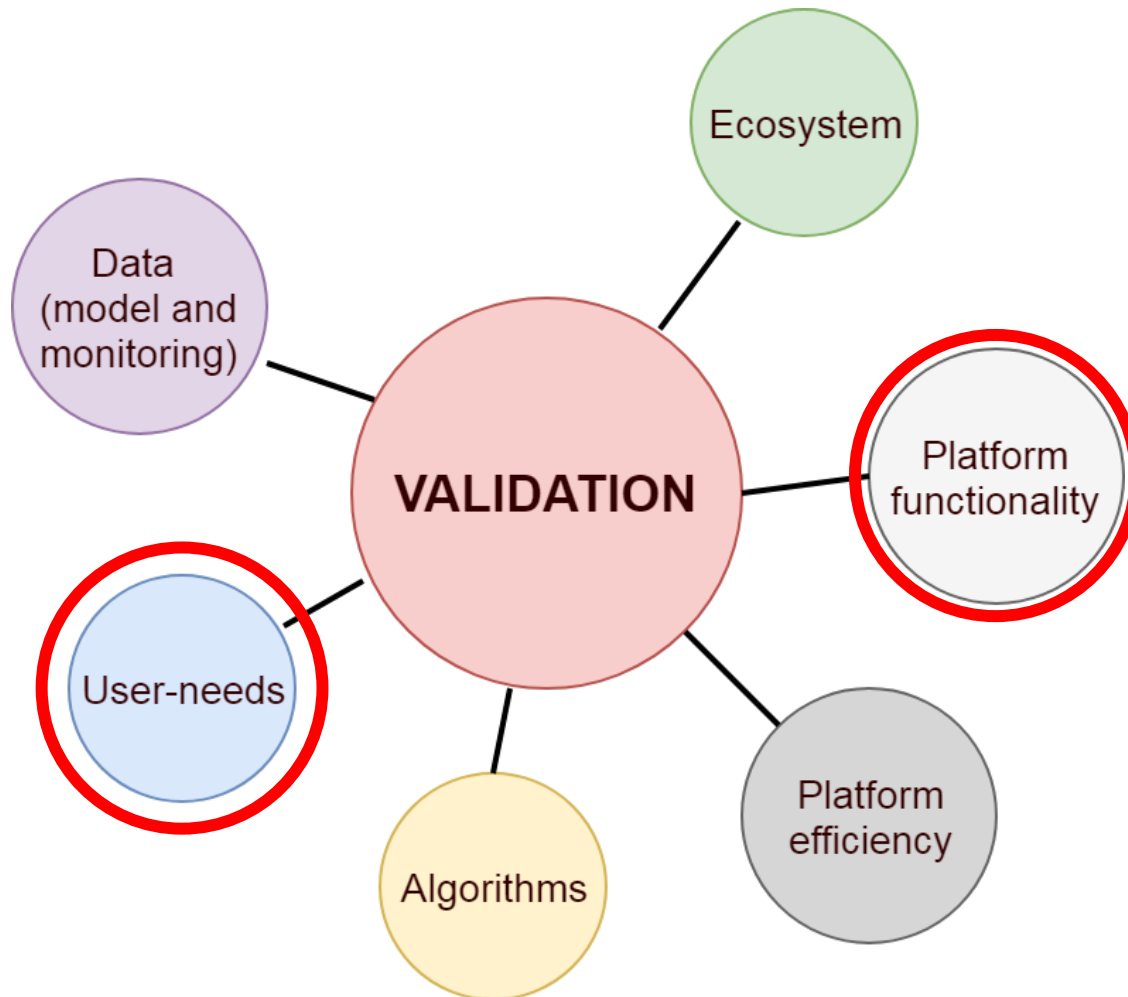
ODYSSEA  
End-user  
Services



# Validation



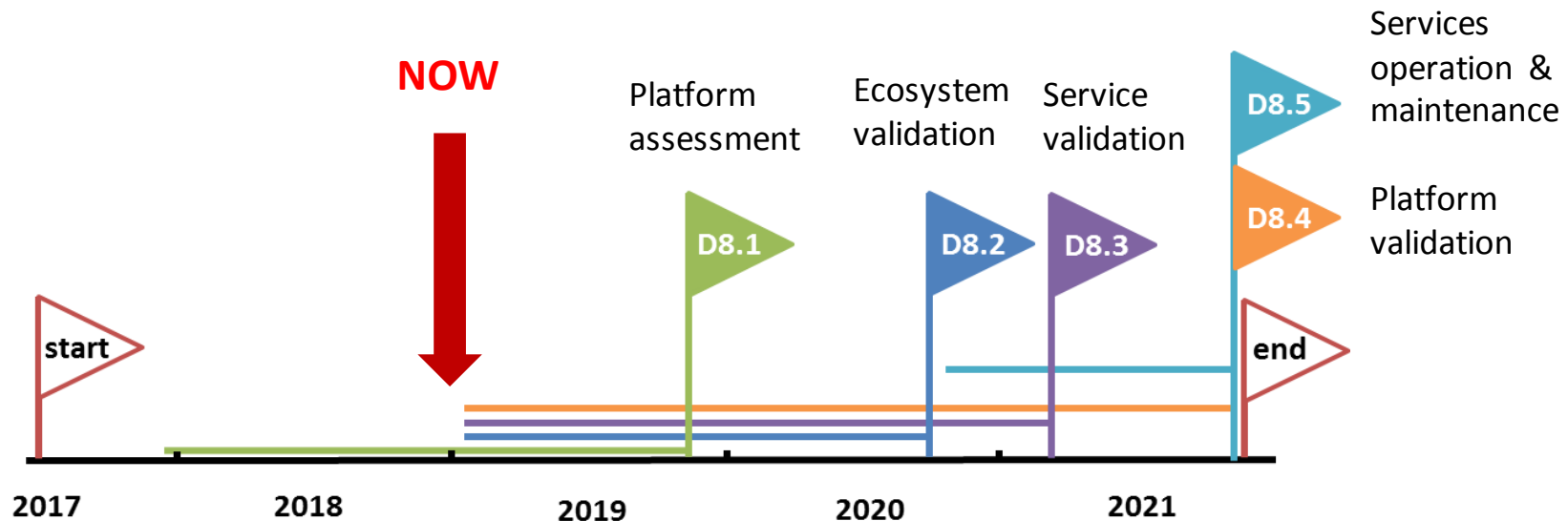
ODYSSEA





# Timing of activities

- Platform assessment started in the previous year but most of the activities are starting this month





# Platform assessment

- **Objectives:**
  - **Evaluate the working effectiveness and suitability**
  - **Measure the user friendliness and operability of the platform**
  - **Provide feedback to shape the platform**
- **The first experimental platform assessment** was done during the first ODYSSEA summer school (3-12 September 2018, Greece):
  - the exploration of CMEMS products,
  - investigating the data and parameters,
  - downloading and processing these datasets
  - combining them with other available datasets
- **Feedback from consortium:**

Issues and feedbacks were addressed:  
[issues@odysseaplatform.eu](mailto:issues@odysseaplatform.eu)







# Translating user needs to services



ODYSSEA

User	User needs	Provided products & services
<b>Offshore</b> 	Do we comply with EU regulations concerning water quality?	Historical data on <b>water quality indicators</b> , aligning with relevant EU directives
	Suitable locations for expanding/optimizing maintenance investments (dredging efforts)?	Historical data on <b>sediment dynamics, and hydrodynamics</b>
	How can we increase our navigation safety?	Near real-time and short-term forecast on <b>waves, currents and possibly wind</b>
<b>Aquaculture industry</b> 	How can we monitor water quality?	Historical, near real-time and short-term <b>forecast maps on primary production and algal biomass</b>
	How can we find suitable location for expansion?	Historical data on variables indicating optimal living conditions for cultured species + <b>habitat suitability maps</b>
<b>Tourism sector</b>	How can we monitor water quality?	Near real-time and short term forecast maps and <b>alerts on algal bloom extent.</b>
	How can we monitor water safety conditions (swimmers, recreational boats etc.)?	<b>Alerts on extreme wave and wind conditions</b>



# Translating user needs to services



ODYSSEA

- As a first approach 3 services were chosen:

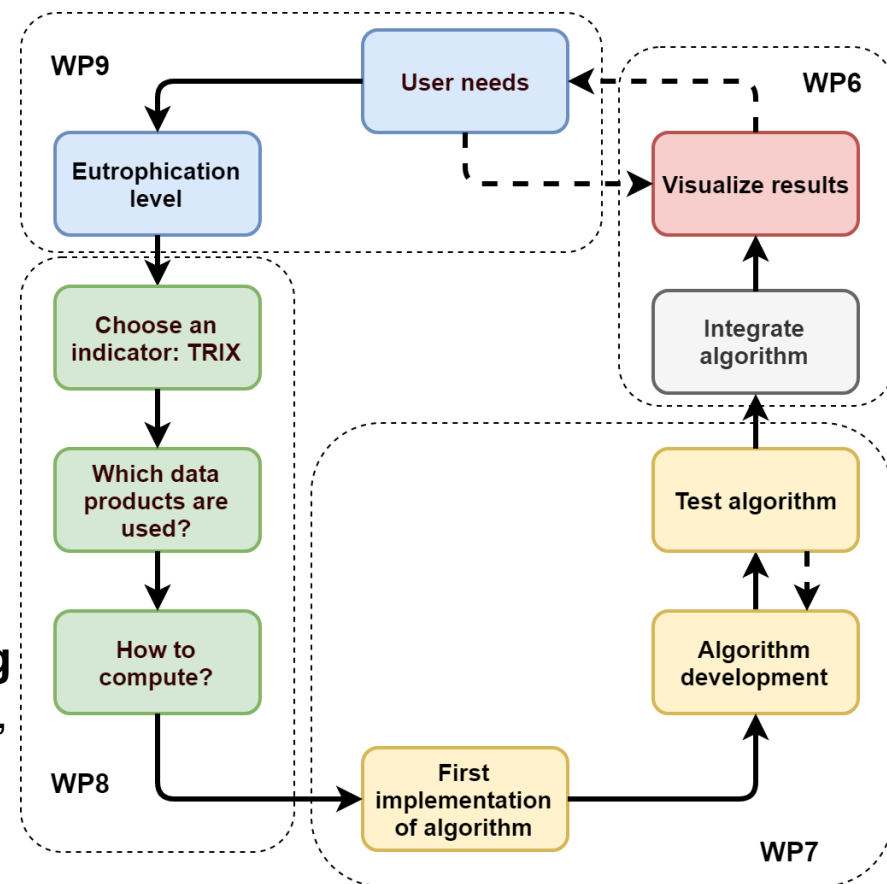
- **TRIX** - Eutrophication indicator (in process)
- **Wave power** - Marine renewables
- **Erosion rates** – Shoreline changes

- Action Teams were formed:

- Team leader
- Scientific expert
- Front-end
- Back-end
- Algorithm developer

- Users are involved to define the following

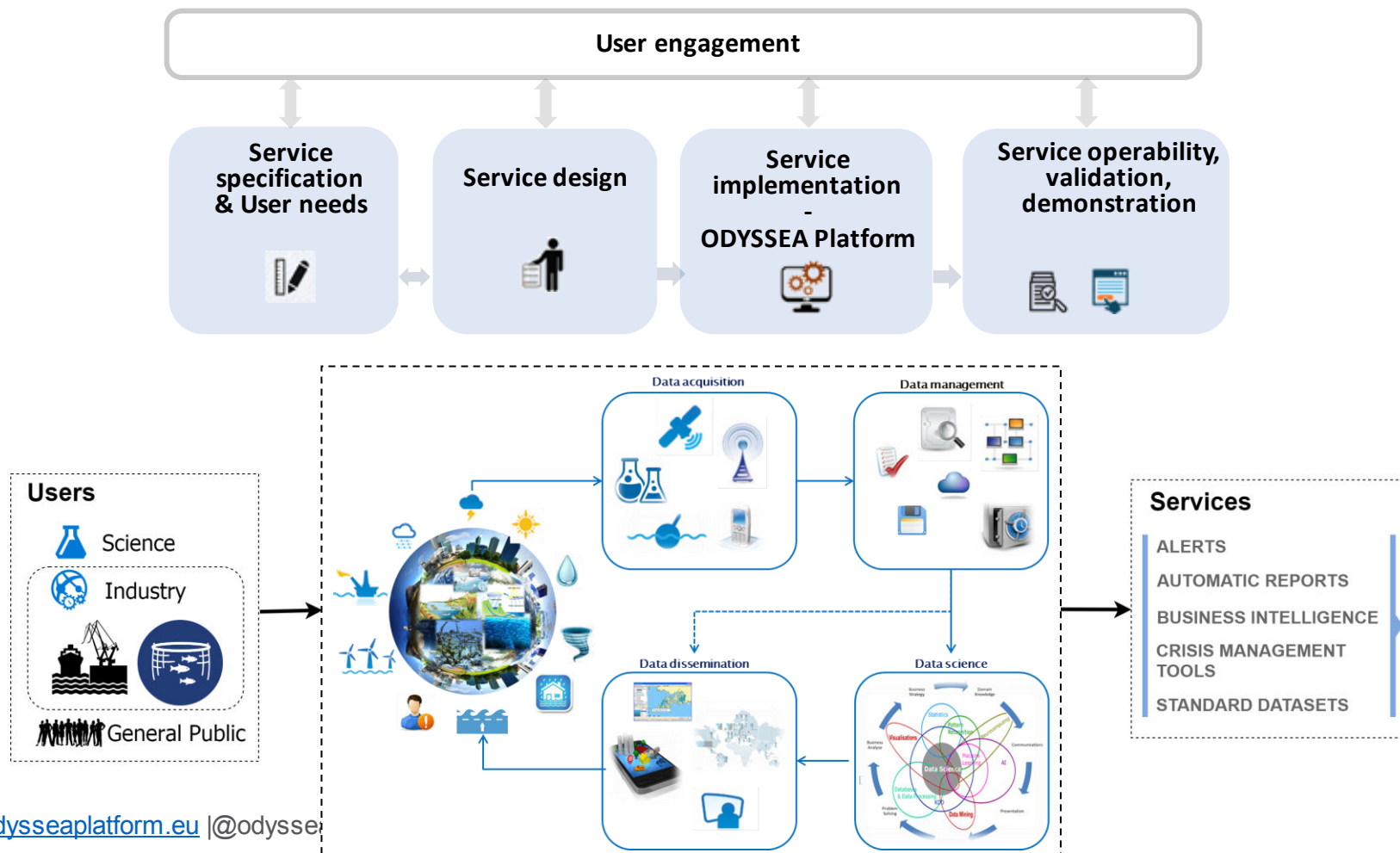
- Type of visualization (time series, maps, text messages, etc.)
- Expected spatial/temporal resolution
- Time window (historical, real-time, forecast)





# Defining services

Iterative process, co-designed with users (collaboration with WP9).

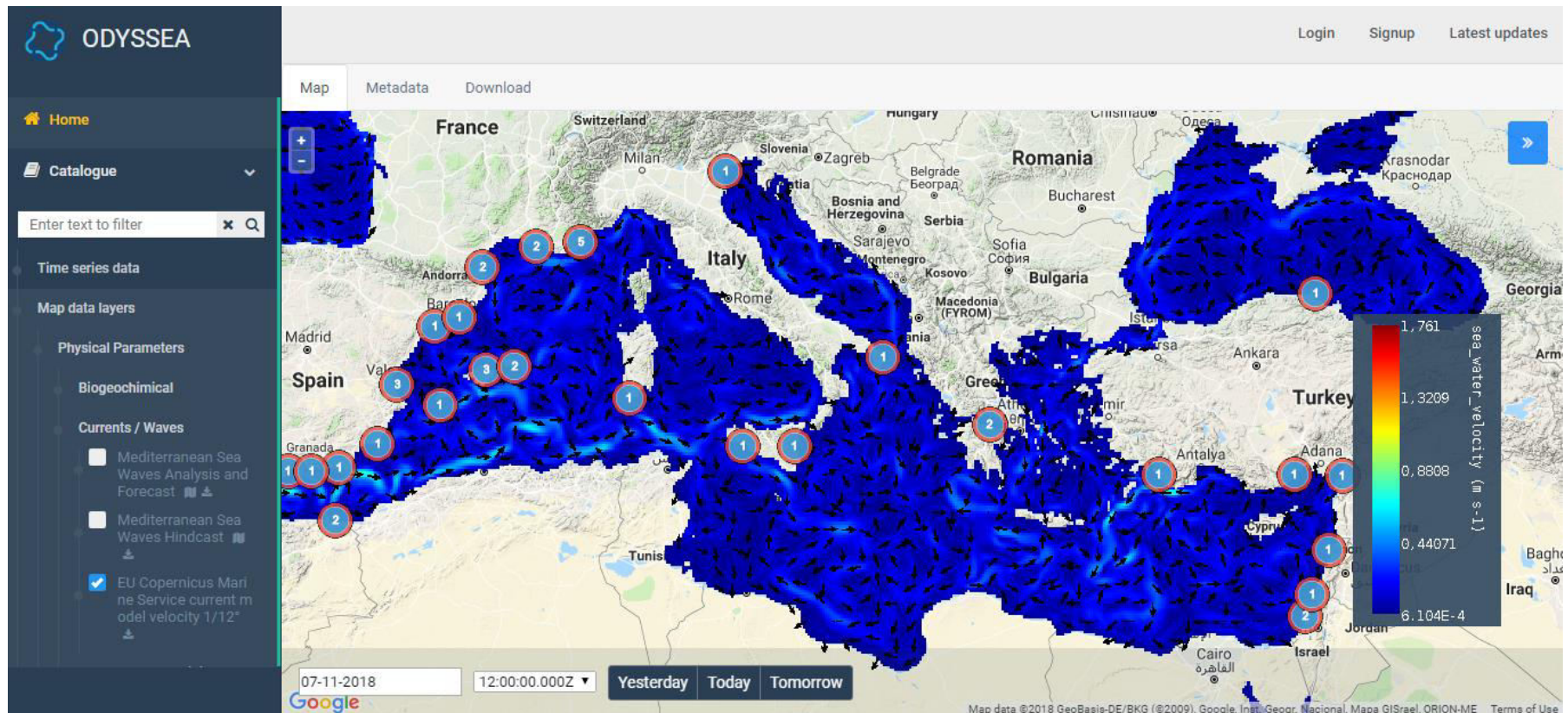




# ODYSSEA Platform



ODYSSEA









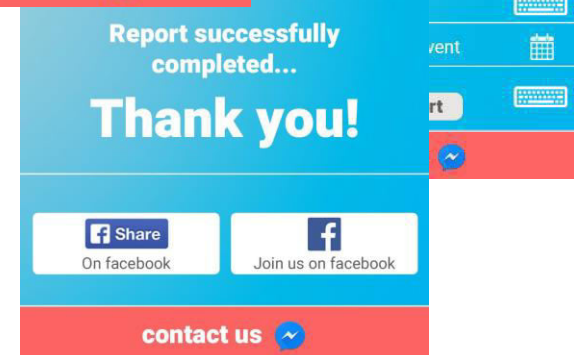
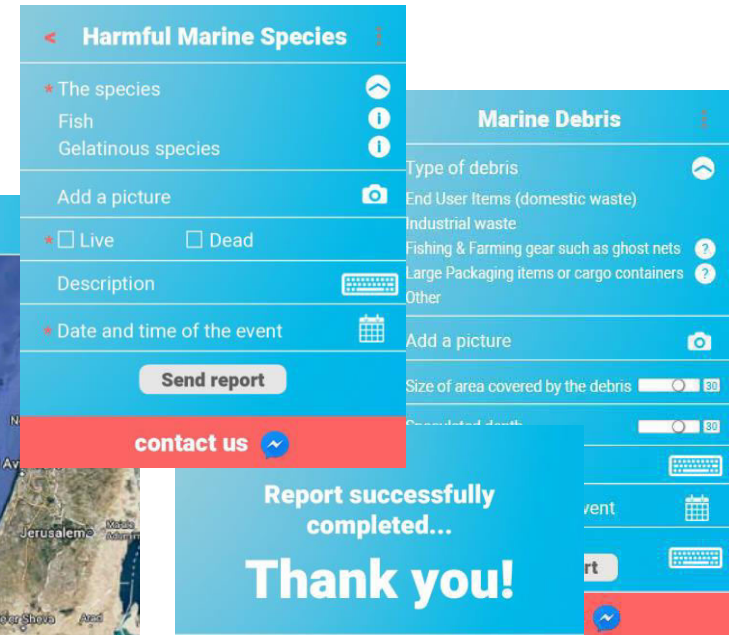
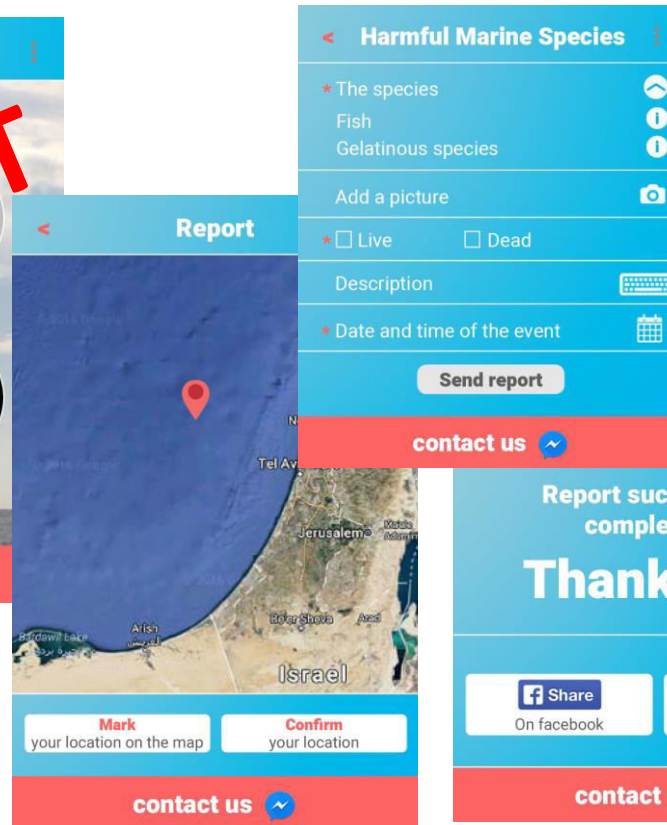
# Citizen Science App - SeaWatch



ODYSSEA

**Goal:** Public contribution for management and alerts in the Mediterranean Sea

Source: SPNI





# Important steps

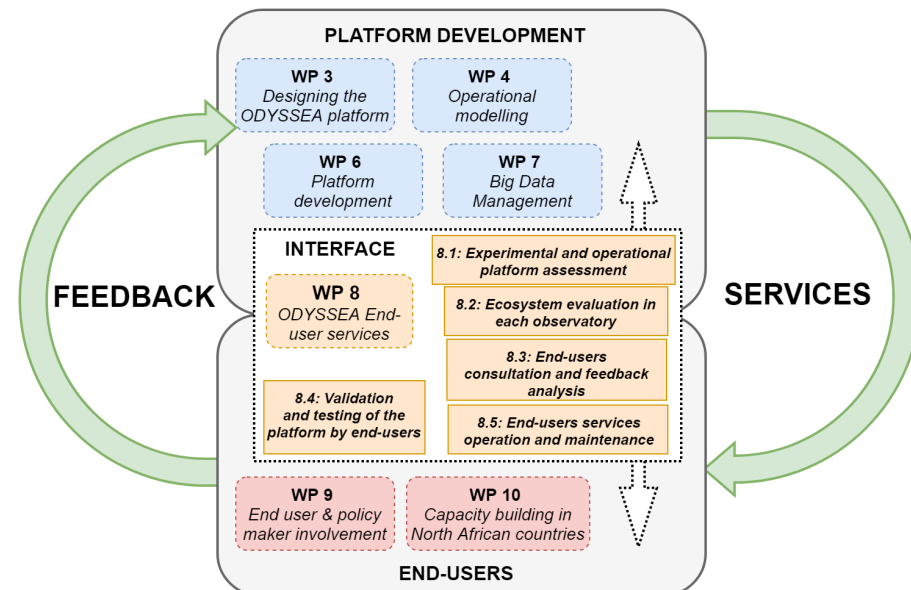


- Establish **sustainable** supply chains:
  - Complete **integration** into the user processing chain
  - Value added product and services to open **new market opportunities**
  - Establish a product that **answers the user needs** and demonstrate its value to the users community
- State-of-the-art information access through Apps and web-viewers (e.g. ODYSSEA platform, citizen science app)



# Next steps planed

1. Continue platform assessment when platform version 1 is released
2. Conduct ecosystem assessment in the observatories using based on ODYSSEA platform data
3. Organize end-user consultation and validation workshops (collaboration with WP9-10)
4. Prepare Data Management Plan for generated data (service level agreement)





# PLATFORM DEVELOPMENT - ALGORITHMS

RV1 Review Meeting, Brussels

*Noam Miron*

Technion

[noam.e.miron@gmail.com](mailto:noam.e.miron@gmail.com)



This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 727277



# Why Algorithms?



ODYSSEA

- Transforming raw data into readily available and usable information for the specific end users
- Interpolating, forecasting and deriving statistics based on data coming from the observatories
- Adding value to the existing data is key to achieving the project's sustainability

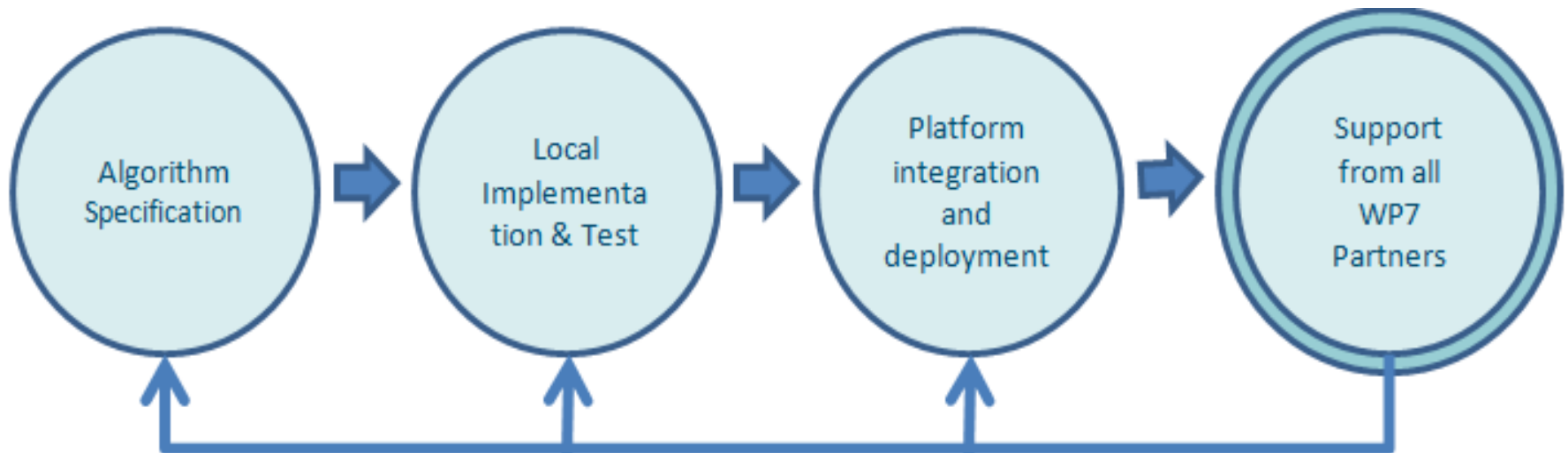


# Algorithm Development Cycle



ODYSSEA

- In order to develop algorithms in a clean and efficient manner there is a need to follow a certain development cycle





# The First Steps

- Identify the requirements of data structures and data management
- Develop algorithms in parallel to the platform and observatories; use existing DB's
- D7.1 and 7.2 explored the existing resources and data standards (e.g. NetCDF) and defined a few reference algorithms
- The first algorithm ready for integration is the TRIX algorithm



# Validation and Maintenance



- Validate integrated algorithms against measured data and maintain its operation within the ODYSSEA platform
- Adapt algorithms to meet changing needs of existing and new end users



# Summary

- Standard algorithm development cycle
- First algorithm ready for platform integration (WP6)
- Close communication with WP 8, 9 to provide solutions according to end user needs for future algorithm development



# PLATFORM DEVELOPMENT - DATA MANAGEMENT

RV1 Review Meeting, Brussels

*Adelio Silva*

Hidromod

[adelio@hidromod.com](mailto:adelio@hidromod.com)



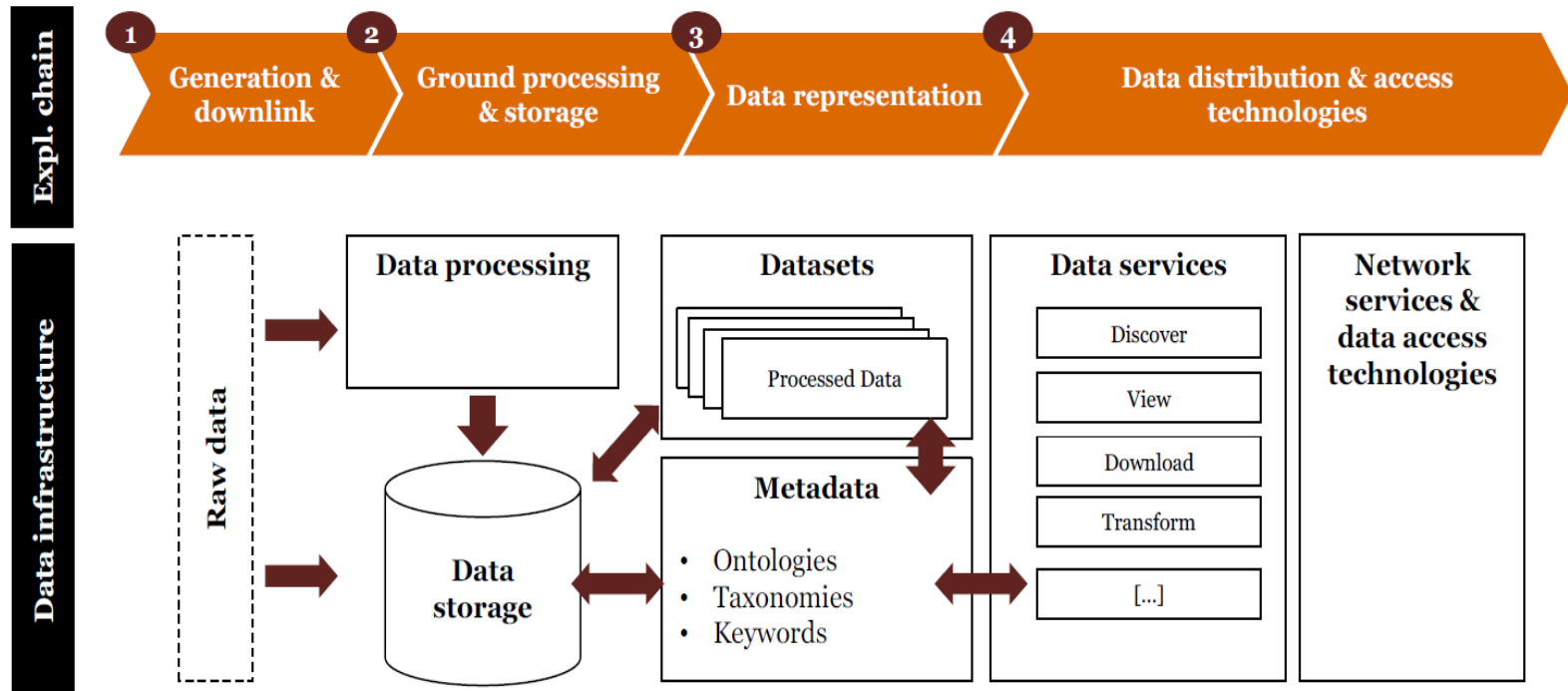
This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 727277



# Data flow



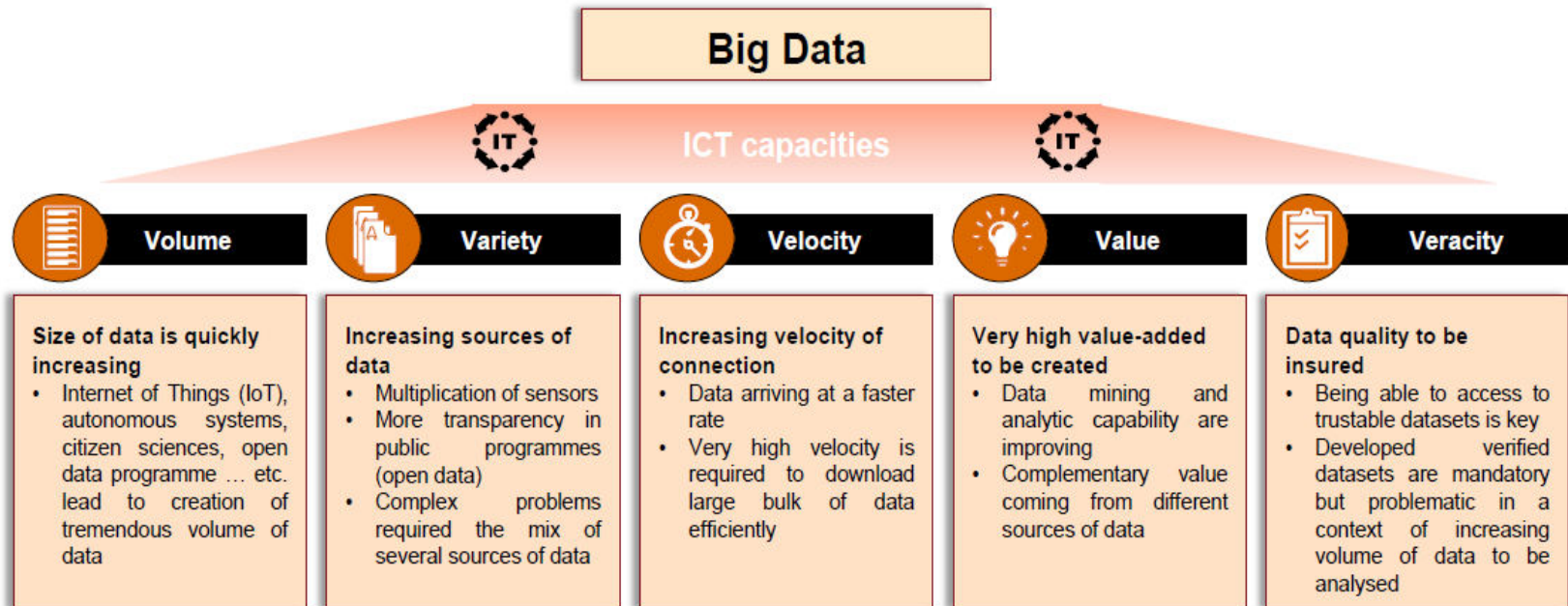
ODYSSEA



Generic data exploitation chain (PWC, 2016)



# The big data challenge



The five Vs of the Big Data paradigm (Sources: PwC-Strategy&, inspired by ESA and SAC (2015))



# Data management approaches



ODYSSEA

The overall strategy was described in **D3.2** and updated in **D3.3**. The practical implementation (specially at observatory level) it is under assesement and testing.

In this respect ODYSSEA is seeking to answer (at least) to two different users type which represents also different challenges in terms of data management.

- **Data discovering and download**
- **Services focused in specific user needs**

However offering user fitted services **IS NOT** exactly the same of offering data discovering and downloading. The service users require simple answers for specific questions while the data users are most of the time interested in raw data.



# Data management approaches



ODYSSEA

A description of ODYSSEA novelties puts in evidence in some extent these diverse requirements...

- 1 The **end-user** will be able to **search, retrieve and visualize data** for each specific parameter within a certain time and space window using **one single command, wherever the data are stored (ODYSSEA Novelty 1)**
- 2 User will be able to **download** archived/forecasted **information** and **receive services** for any part of the Mediterranean Sea **through a single system (ODYSSEA Novelty 2)**
- 3 A **set of interactive web tools** will be developed for the front-end of the platform to allow the user to visualise both the location of **data points** (using maps) and the **data values** (using plots / data visualisation layers) **(ODYSSEA Novelty 3)**
- 4 Data from **more observational platforms, systems and networks** will be readily available to end-users through the newly developed platform. Emphasis will be placed on **enriching the system i.e., with meteorological, hydrological and citizen's science data (ODYSSEA Novelty 4)**
- 5 Databases will be re-organized, homogenized and fused to provide data retrieved in a common **standard** type and format, as well as other types and **formats according to end-user requirements (ODYSSEA Novelty 5)**



# The data access: goals to achieve

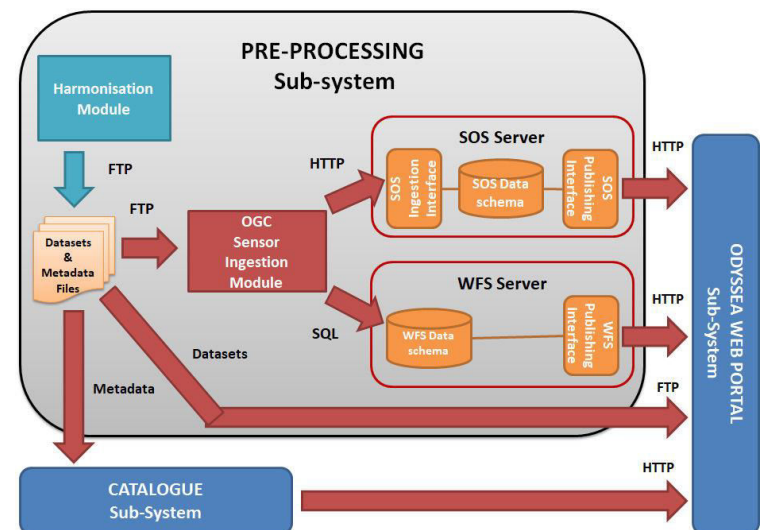


ODYSSEA

ODYSSEA partners have been working on setting up a service chain capable to receive the raw data and convert it to widely accepted standard formats. This implies to introduce the necessary changes in the data format, add the metadata and link it to the catalogue.

The general procedure is:

- ✓ All input data is **standardized**
- ✓ Generate associated **Metadata**
- ✓ **NetCDF-CF** SeaDataNet compliant
- ✓ **Feed services** (SOS, WFS, FTP, ....)





# Guaranteeing the standards



ODYSSEA is adopting widely accepted standard procedures in which concerns the data formats, the metadata and the vocabulary:

- **Metadata** complies with INSPIRE Directives. All metadata entries are organized in GeoNetwork Software (Open-source);
- The **data discovery and retrieving** is based on standard services such as WFS for the gridded data or SOS for time series (novelty);
- The **data formats** follows the standards adopted in other initiatives such as CMEMS or SeaDataNet (NetCDF-CF);
- The **vocabulary** follows the approaches adopted in other initiatives such as CMEMS or SeaDataNet. This means the to use NERC/BODC vocabulary.



# The vocabulary



There were adopted the approaches followed in other initiatives such as CMEMS or SeaDataNet. This means the to **use NERC/BODC vocabulary**. NERC/BODC provide a diversified vocabulary covering not only oceanography, but are areas such environment, geology and atmosphere.

([http://seadatanet.maris2.nl/v\\_bodc\\_vocab\\_v2/vocab\\_relations.asp](http://seadatanet.maris2.nl/v_bodc_vocab_v2/vocab_relations.asp))

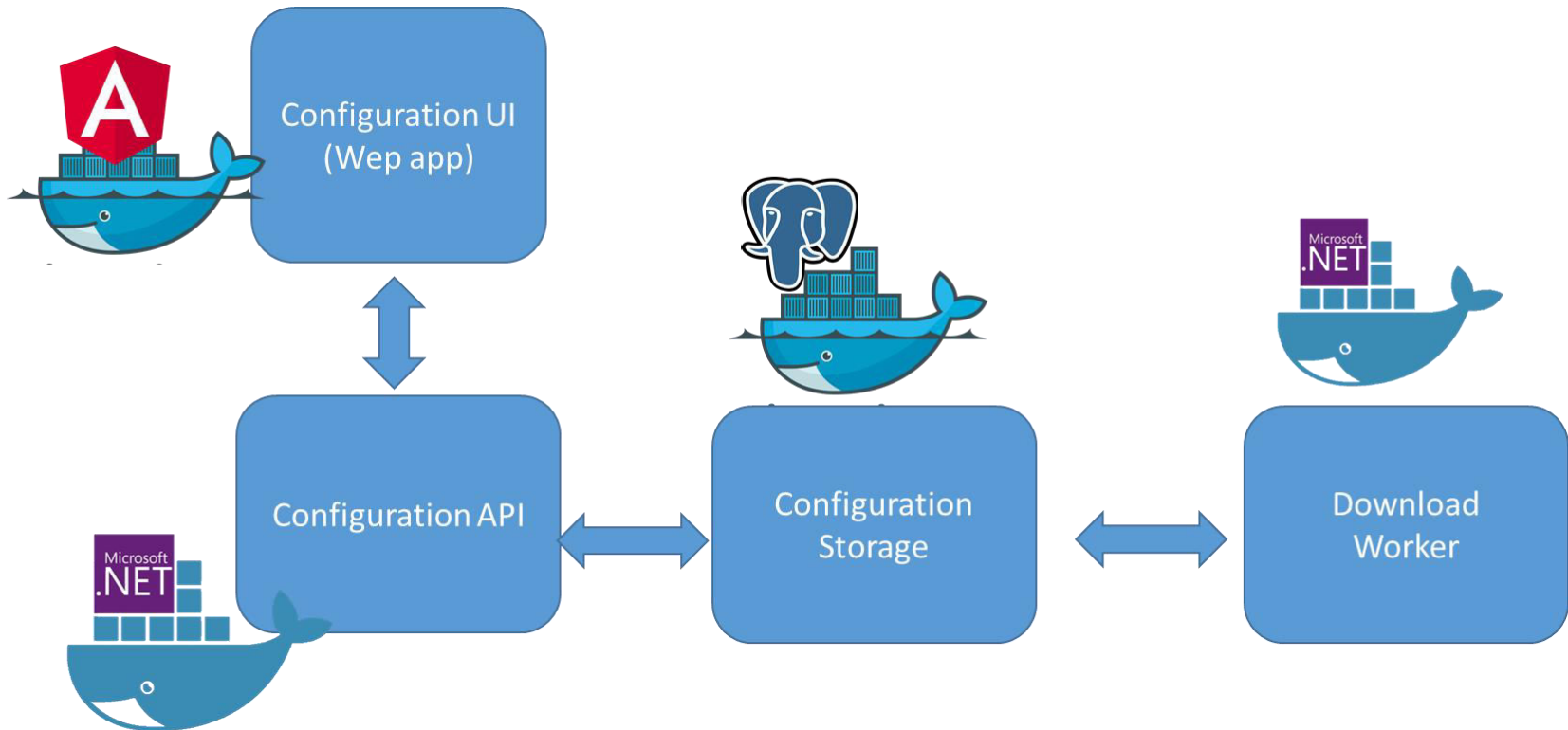
Proper procedures are being implemented in order to be sure that any data source added to the platform fits one of the existent categories.

**However** it is required to pay attention to the potential “huge” number of already existent references to a specific parameter. A strategy is required to deal with this issue.



# Platform implementation example

A data download component using micro services over *docker* images.





# Current status

- Implement the download micro services over docker images
- Implement plugins for download via http and FTP
- Implement enumerators and converters for GLOSS sea level stations and CMEMS *in situ* data
- Testing



# Summarizing and Next Steps



- Next step is to implement new enumerators and converters as new data sources arise.
- Issues related with the “big data” or the local observatories and models data will require some additional attention and testing
- Models results and local data produced by the observatories will require some learning regarding the procedures to observe in the data preparation for uploading (ex.metadata)



# PLATFORM DEVELOPMENT - THE PLATFORM

RV1 Review Meeting, Brussels

*Nicolas Granier (CLS)*

*Simon Keeble (BlueLobster)*

ngranier@cls.fr; simon@bluelobster.co.uk



This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 727277



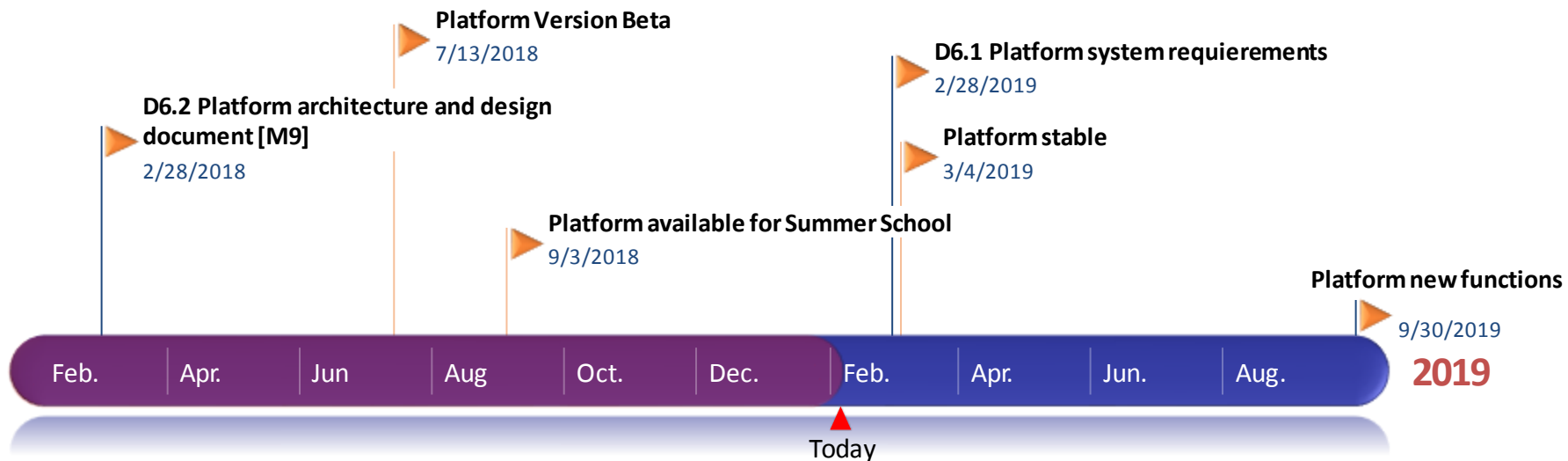
# Main results obtained



- Version Beta platform deployed in July to start an agile process of work
- Platform ready for Summer School in Kavala
- Design of an interoperable and cloud ready platform done
- First feedbacks have been taken into account
- Integration of consolidated version in March 2019
- Design of the future component for next versions
- GDPR rules analyzed
- Distributed version control system deployed (Source code is public on gitshare)
- Ticketing tools to follow tasks and actions used
- All the partners involved in WP6 participated in setting up the platform (good complementarity)



# Deliverables and milestones achieved



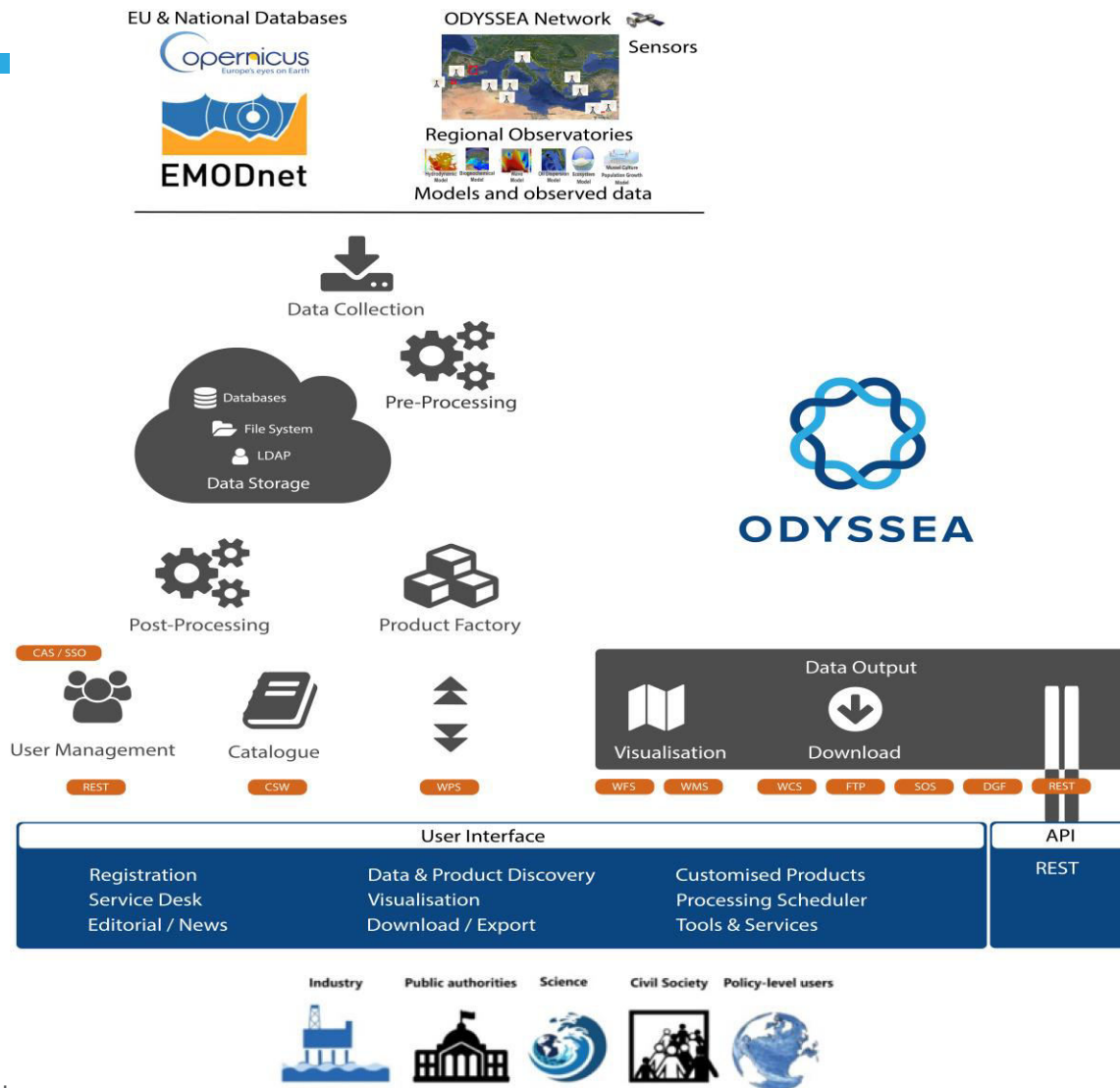
- D6.2 Platform Architecture and design document (Delivered)
- D6.1 Platform system requirements (written in review)



# Main results obtained



ODYSSEA





# Main results obtained



**ODYSSEA Novelty 1:** The **end-user** will be able to search, retrieve and visualize using **one single command, wherever the data are stored** (Already developed)

**ODYSSEA Novelty 2:** User will be able to download archived/forecasted information and receive services for any part of the Mediterranean Sea **through a single system** (In progress)

**ODYSSEA Novelty 3 :** A **set of interactive web tools** will be developed for the front-end of the platform to allow the user to visualize location values of data (using plots / data visualization layers) (Already available)

**ODYSSEA Novelty 4 :** Data from **more observational platforms, systems and networks** will be readily available to end-users through the platform. Emphasis will be placed on **enriching the system with meteorological, hydrological and citizen's science data** (In progress, available for next version)

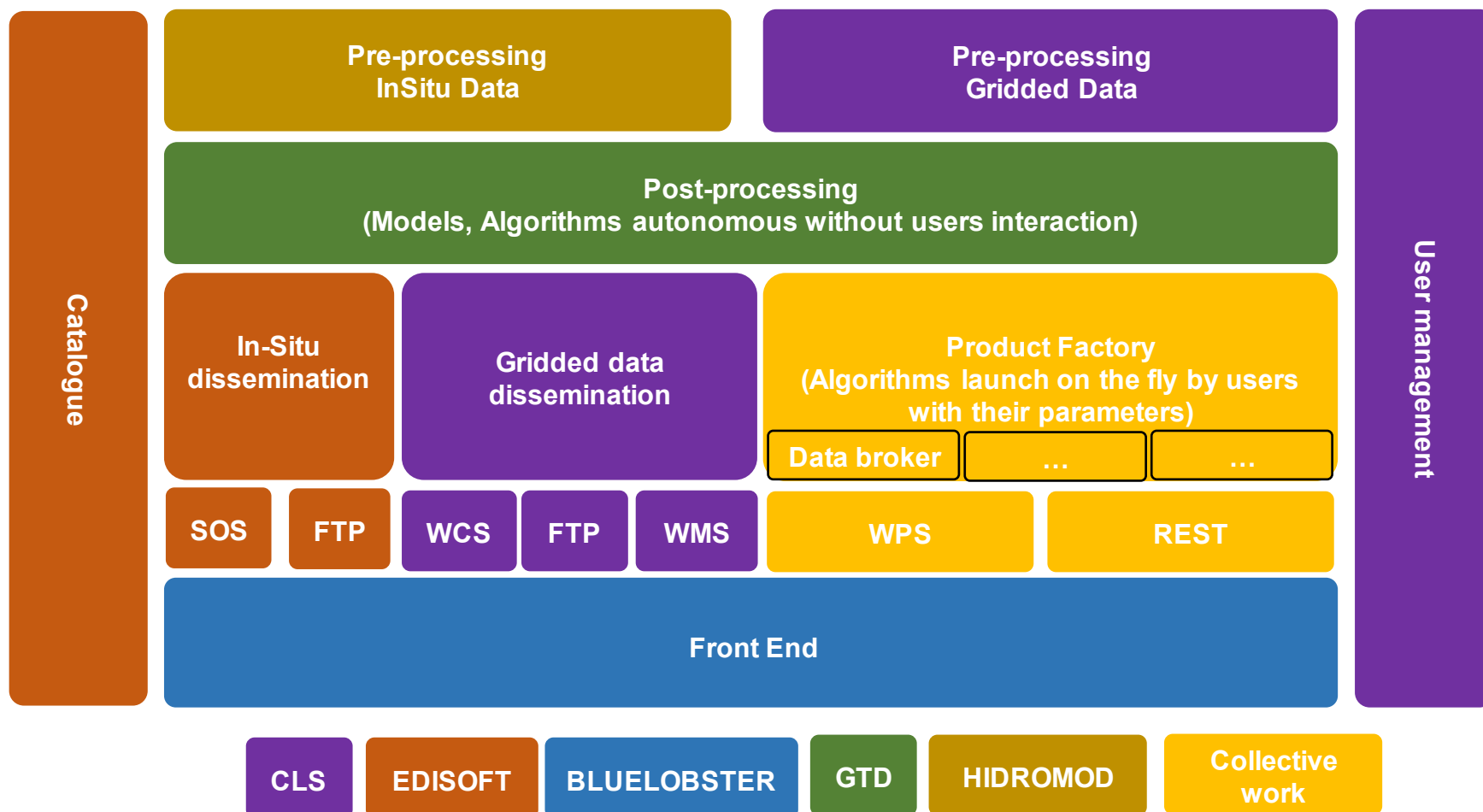
**ODYSSEA Novelty 5 :** Databases will be re-organized, homogenized and fused to provide data retrieved in a common standard type and format, as well as other types and formats **according to end-user requirements** (In progress)



# Organisation



ODYSSEA





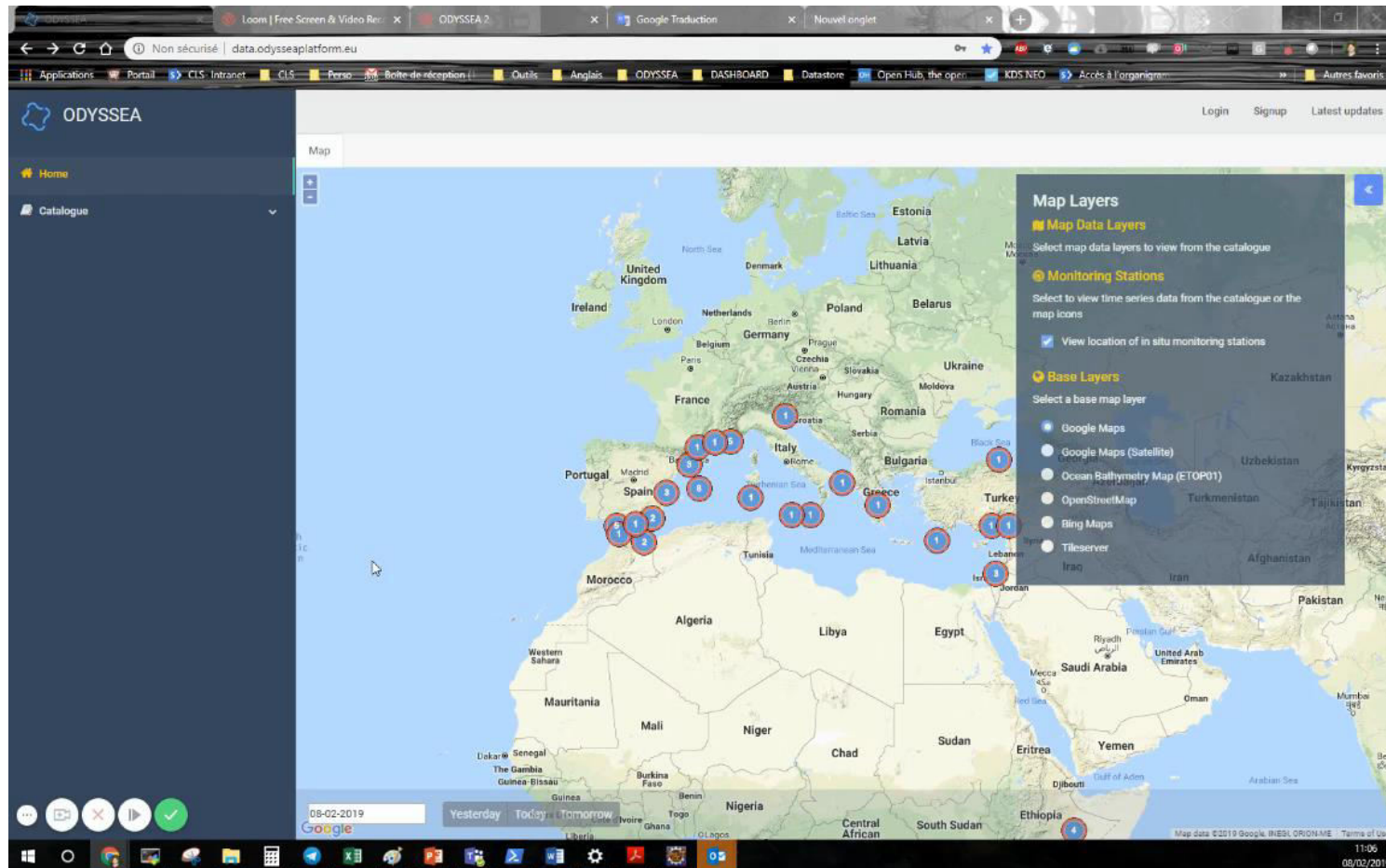
# Organisation



- Each partner is responsible of one or several components
- The source and docker package are pushed on a GitShare and tried on qualification machine
- The components are finally integrated in the CLS premises
- Anomalies and evolutions are followed on a ticketing system



# Demonstration





# Next steps planned

- Consolidate the platform deployed
- Add new algorithms in post-processing
- Ingest data from observatories
- Launch the interactive mode between users and processing (WPS)
- Buy machine to deploy the platform



# THANK-YOU

*Nicolas Granier (CLS)*

*Simon Keeble (BlueLobster)*

[ngranier@cls.fr](mailto:ngranier@cls.fr); [simon@bluelobster.co.uk](mailto:simon@bluelobster.co.uk)



This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 727277