



iFishIENCI



**ONLINE
WORKSHOP**



**FROM DATA INTEROPERABILITY TO
DATA SPACES IN THE AQUACULTURE
DOMAIN**

Join us at 14:30 CET on Tuesday, 28th February

AGENDA

14:30 - 14:50 - Introduction
Franck Le Gall (EGM)

14:50 - 15:10 - BlueCloud : The open science platform for collaborative marine research
Anton Ellenbroek (FAO)

15:10 - 15:30 - PANGAEA: Data publisher for earth & environmental science
Astrid Wittmann (Leibniz ZMT)

15:30 - 15:50 - The ISO 128777:2011 standard
Petter Olsen (Nofima)

15:50 - 16:10 - GREAT (Green Deal Data Space)
Nevena Raczko (IDC)

**16:10 - 16:30 - Pathway toward a EU data space for aquaculture
(panel discussion)**
Elisa Ravagnan (NORCE)

GENERAL APPROACH @EGM



Deployment of
open decision
support solutions

Open Solutions
=
open-source +
ETSI
standardisation

From data Interoperability to data space in aquaculture





iFishIENCI

Intelligent Fish feeding through Integration of ENabling technologies and Circular principle

Franck Le Gall
EGM



This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 818036

Call: H2020-BG-2018-2020
Topic: DT-BG-04-2018-2019

iFishIENCi solutions for sustainable growth

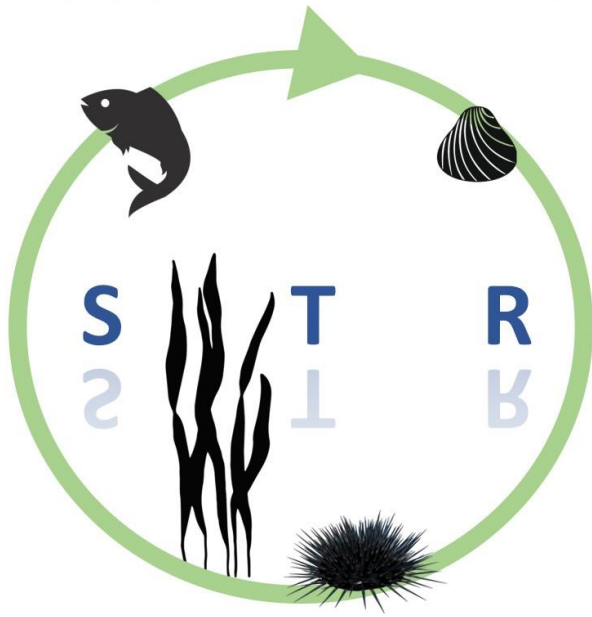
- Environmental limitations
 - Waste from aquaculture
 - Genetic interactions with wild populations
- Feed sustainability
 - Efficiency of feeding (5-?% uneaten)
 - Alternative feed ingredients
- Disease and parasite problems
 - Emerging new diseases especially viruses
 - Outbreaks of existing diseases
 - Sea lice of salmon
- Impacts of climate change on aquaculture
- Economic costs of modern production system
- Societal acceptance

iFishIENCi Products



All Atlantic Ocean Sustainable Profitable and Resilient Aquaculture

A
A



A L
A L

H2020 ASTRAL: A collaborative ecosystem for IMTA aquaculture in the Atlantic

Franck Le Gall (EGM)

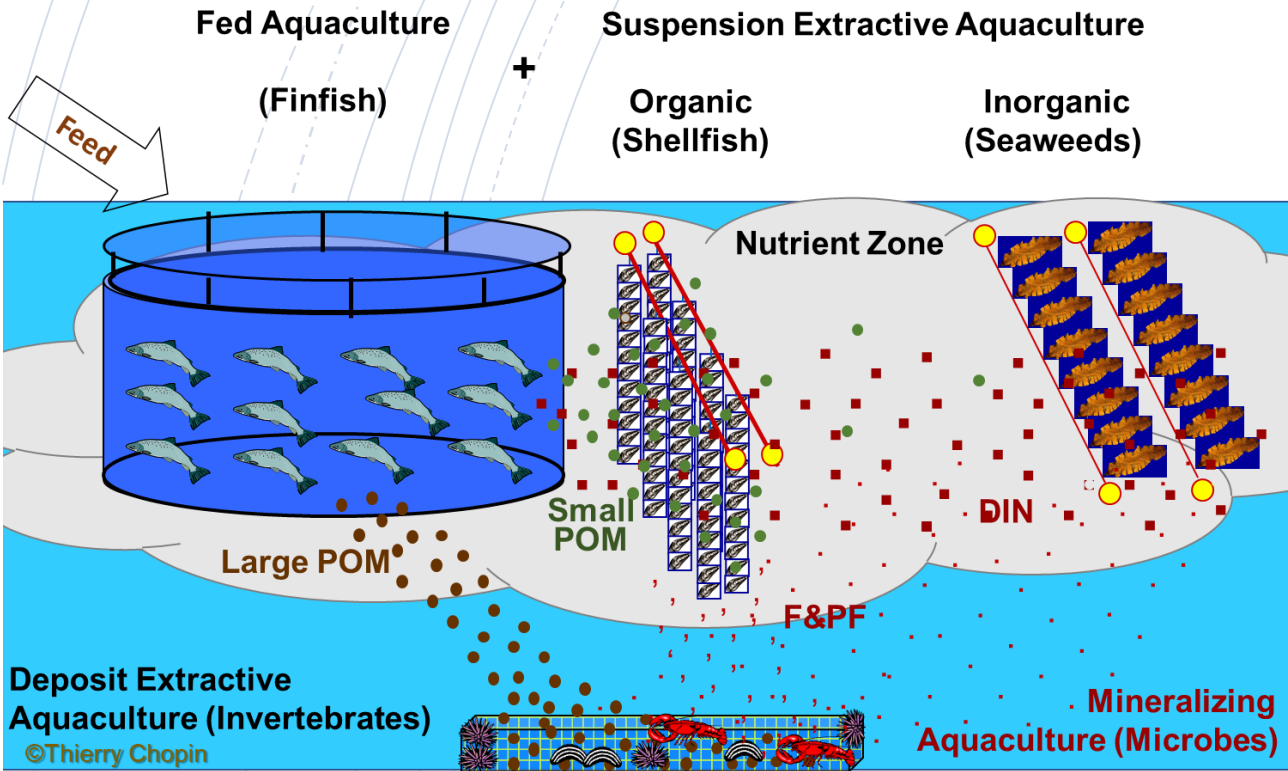


This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 863034.

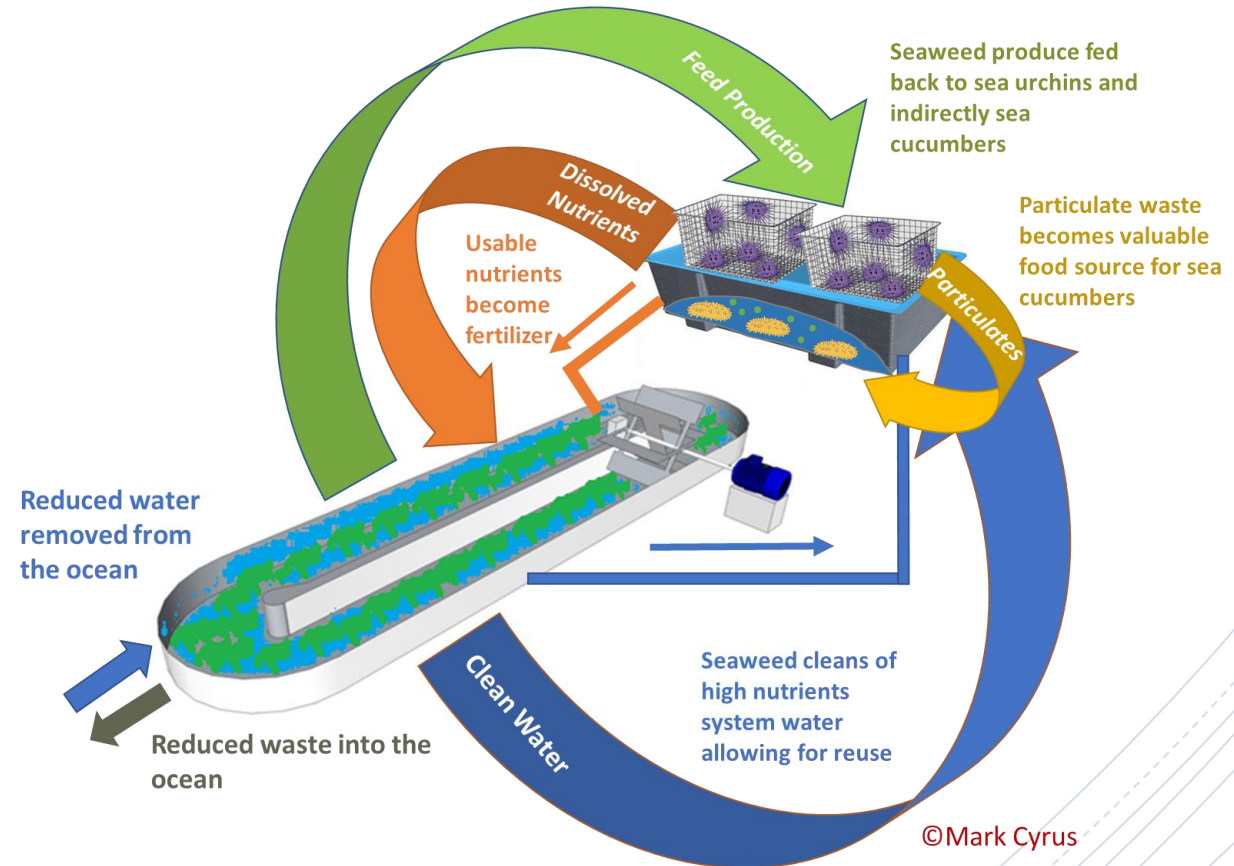
Integrated Multi-Trophic Aquaculture (IMTA)



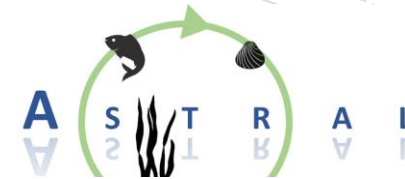
Open system



RAS system



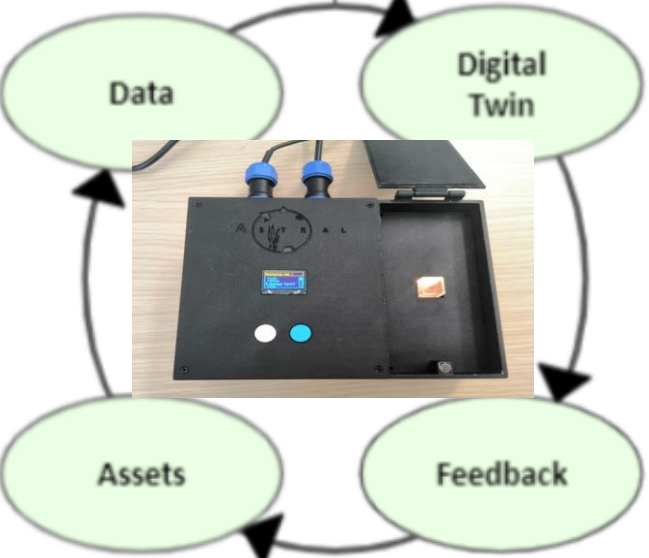
ASTRAL Pool of Technology Innovations



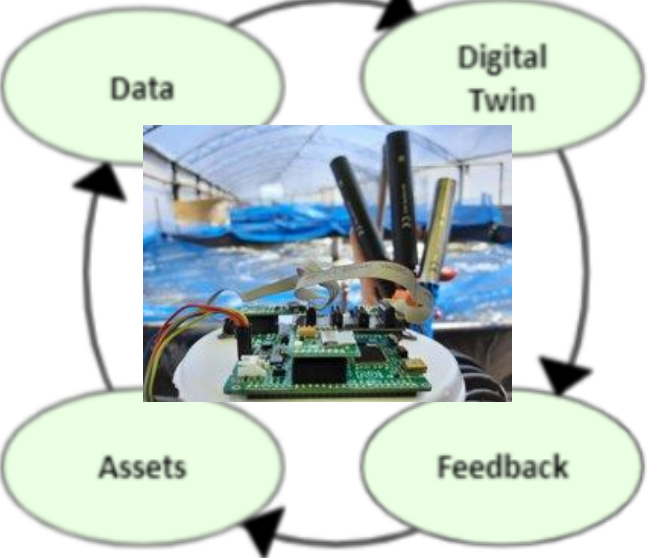
ASTRAL AIDAP Artificial Intelligence Data Analytics Platform

- + Environmental proxy
- + Animal welfare
- + Microplastic
- + Physico-chemical variables
- + Essential water quality variables
- + Biomass estimation
- + HAB monitoring

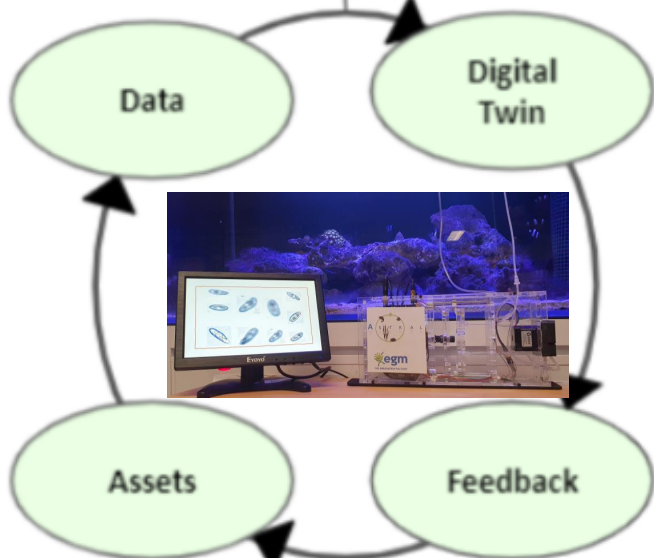
Biosensors & Spectrometers



Low cost IoT kits



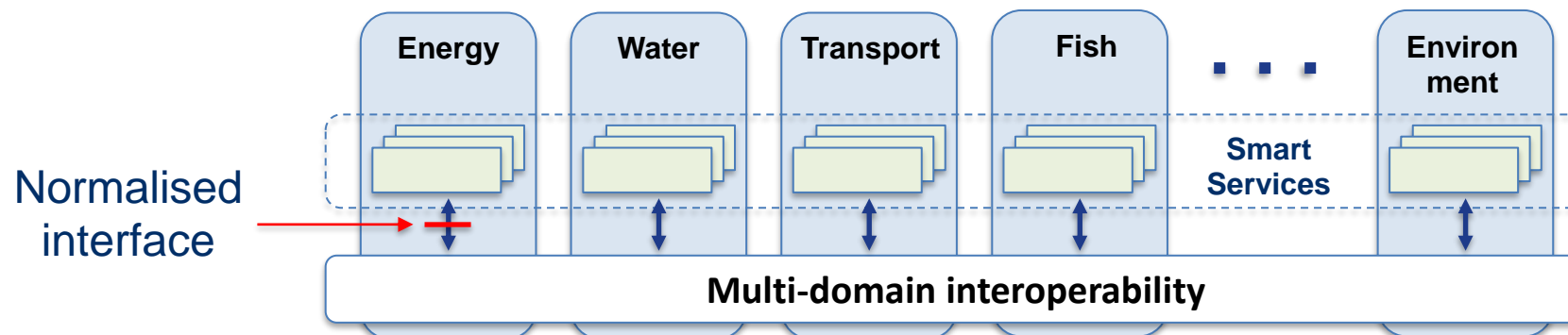
Vision sensors



NEED FOR CROSS DOMAIN INTEROPERABILITY



- Organizations in different domains can exchange data based on a common contextual information management layer
- Authorization and access control policies govern who can access what and when (data sovereignty)
- Organizations can monetize the data they offer (data economy)



ACHIEVING INTEROPERABILITY

Definitions

Examples

Resolves issues with understanding the meaning of data ("the substance")

SEMANTIC
INTEROPERABILITY

The context is specified (eg medical) and makes it possible to understand that the observed temperature of 37°C is normal

Resolves data encoding and formatting ("shape") issues

SYNTACTIC
INTEROPERABILITY

The JSON structure of the messages makes it possible to identify the data fields

Solves the technical problems of connection between 2 systems

TECHNICAL
INTEROPERABILITY

2 systems exchange content in MQTT

THE NGS-LD SPECIFICATION AS A BASIS IN BOTH PROJECTS



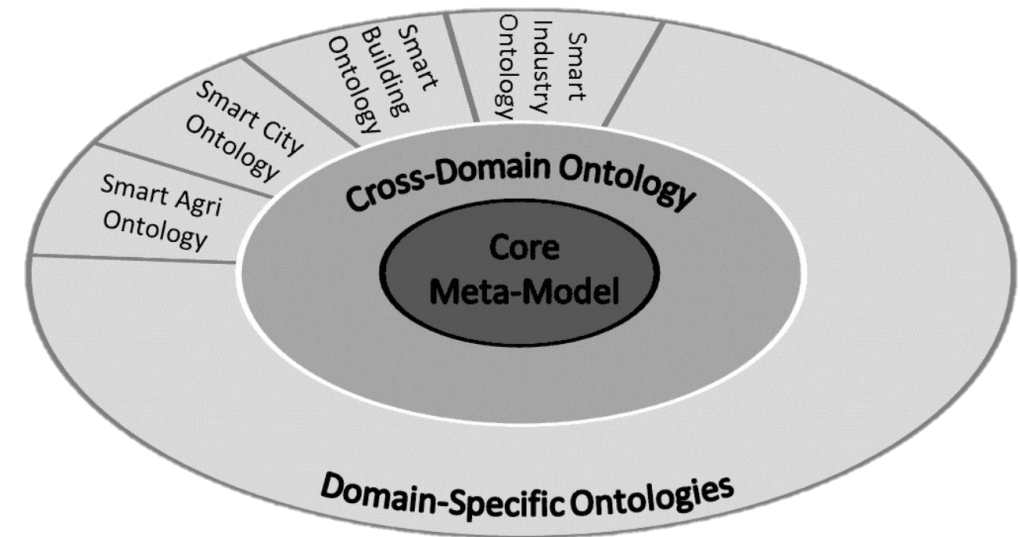
- A specification created by ETSI, in constant evolution
- A RESTful API to manage and interact with the information context
- A “cross-business” data model to promote interoperability
 - Based on an Entity - Property - Relationship graph
 - Allows to define a common language
- Version 1.6.1 released, version 1.7.1 in draft
- More information: <https://www.etsi.org/committee/cim>

META MODEL DEFINITION

Principles

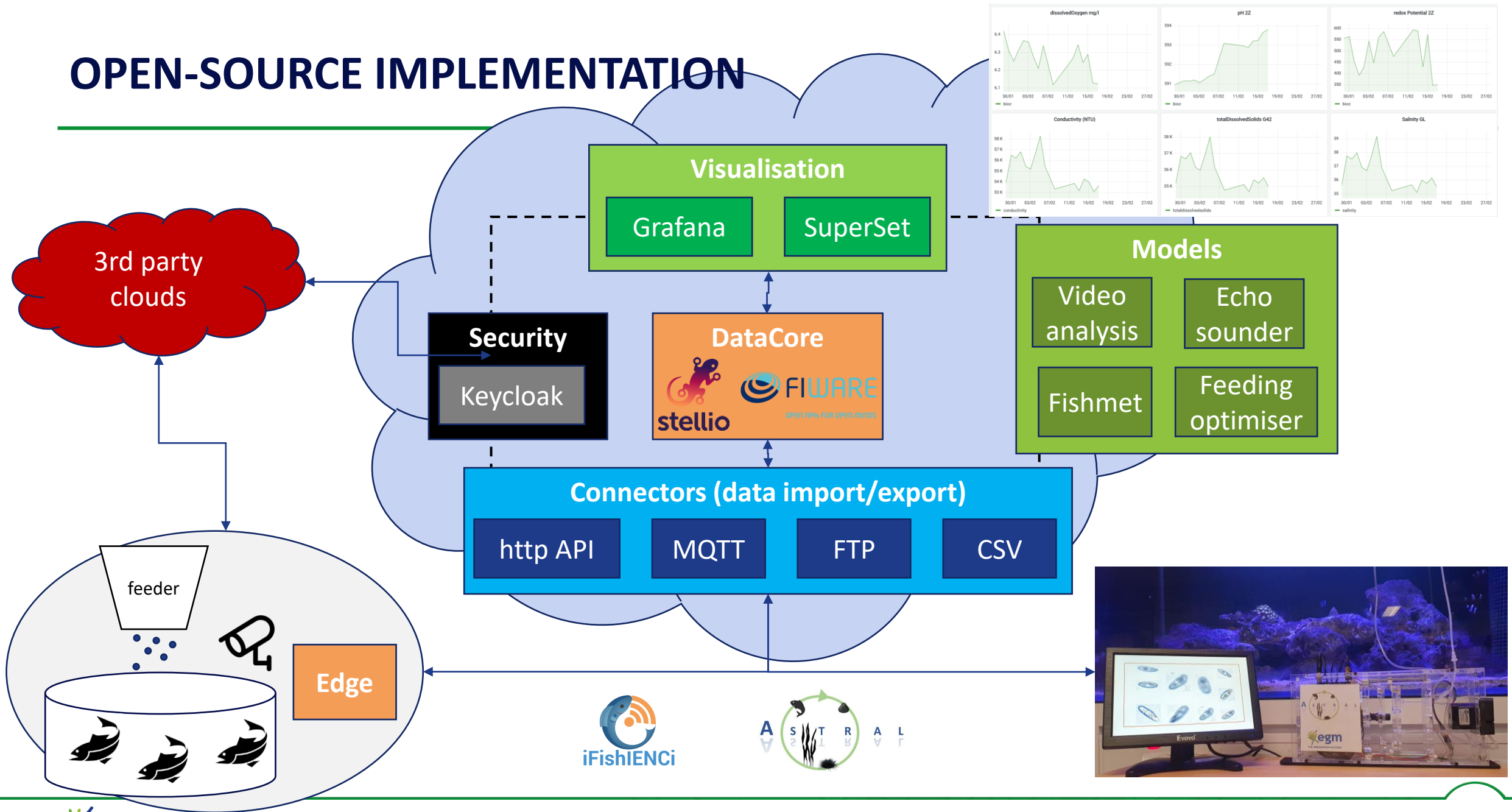
Definition and sharing of common models

- Controlled via the definition of a JSON schema
- Accompanied by concrete examples
- For the purpose of scalability
- Online guide



FINDABLE **A**CESSIBLES **I**NTEROPERABLES **R**EUSABLE

OPEN-SOURCE IMPLEMENTATION



OUR CONTRIBUTIONS

- Open-source : [FIWARE catalog](#)

The screenshot shows the FIWARE website's 'COMPONENTS' page. At the top, there is a navigation bar with the FIWARE logo and menu items: 'About FIWARE', 'Technology', 'Community', 'Ecosystem', and 'Events & Media'. The main heading is 'COMPONENTS'. Below it, there are two paragraphs of text. The first paragraph describes the FIWARE framework of open source software platform components. The second paragraph describes the FIWARE NGSI API, its evolution, and the role of the FIWARE Community. Below the text, there is a diagram showing a stack of components: 'Deployment tools' (left), 'Context Processing, Analysis, Visualization' (top), 'Core Context Management (Context Broker)' (middle), and 'IoT API Management Application Monetization' (right).

COMPONENTS

FIWARE brings a curated framework of open source software platform components which can be assembled together and with other third-party components to build platforms that support the development of Smart Solutions faster, easier and cheaper. The main and only mandatory component of any "Powered by FIWARE" platform or solution is a FIWARE Context Broker Generic Enabler, supplying a cornerstone function required in any smart solution: the need to manage context information, enabling to perform updates and bring access to context.

FIWARE NGSI is the API exported by a FIWARE Context Broker, used for the integration of platform components within a "Powered by FIWARE" platform and by applications to update or consume context information. [FIWARE NGSI API specifications](#) have evolved over time, initially matching [NGSI-v2 specifications](#), now aligning with the [ETSI NGSI-LD standard](#). The FIWARE Community plays an active role in the evolution of ETSI NGSI-LD specifications which were based on NGSIv2 and commits to deliver compatible open source implementations of the specs.

Building around the FIWARE Context Broker, a rich suite of complementary open source FIWARE Generic Enablers are available, dealing with the following:

- Interfacing with the Internet of Things (IoT), Robots and third-party systems, for capturing updates on context information and translating required actuations.

```
graph TD; subgraph Components; direction TB; A[Deployment tools]; B[Context Processing, Analysis, Visualization]; C[Core Context Management (Context Broker)]; D[IoT API Management Application Monetization]; end
```

- Data models : [community data model sharing](#)

The screenshot shows a GitHub repository page for 'dataModel.Aquaculture / FishPopulation'. The repository is owned by 'albertoabellagarcia' and has a commit titled 'test of SQL export'. The file list includes:

File Name	Description
doc	corrected GeoProperty spelling
examples	Fixed missing @context
ADOPTERS.yaml	fixed adopters.yaml
README.md	updated on 2022-07-20T11:47:04.463504
model.yaml	updated model.yaml
schema.json	fixed adopters.yaml
schema.sql	test of SQL export
schemaDTDL.json	beta version of DTDL digital twin
swagger.yaml	removed new_model.yaml

Below the file list, there is a section for 'README.md' with the title 'FishPopulation' and the version 'Version: 0.0.1'.

Thank You!



Franck Le Gall

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