Improving the environmental monitoring cycle, remote sensing & space technologies

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LifeWatch ERIC

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LifeWatch ERIC Infrastructure

- What does LifeWatch ERIC offer?
  - Tools for the scientific community to ease the access, process and authoring of data in their researches
  - VRE: Virtual Research Environments – access to all the tools
  - Workflows: Process modules for data
  - LifeBlock (blockchain): Ensure the traceability of data and their processes
- All these tools are supported by LifeWatch ERIC's infrastructure

LifeWatch ERIC Infrastructure

- Needed to store, compute and process all the information collected by all the acquisition units

- Infrastructure is distributed over several computing and storing nodes

- Availability is a must:
  – Redundancy
  – Monitoring
 – SOC (Security Operations Center)
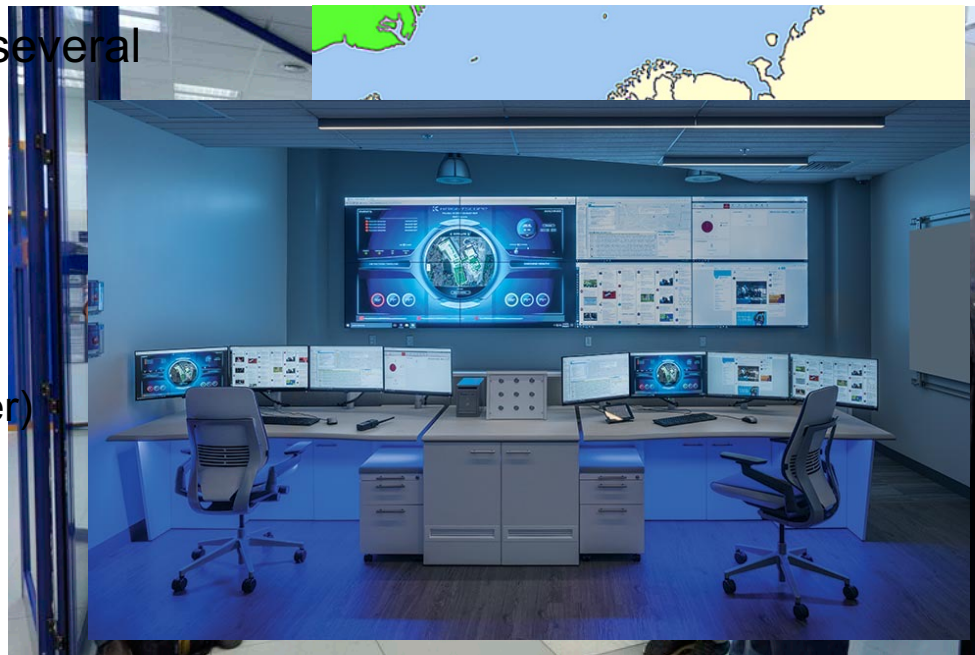
Monitoring

- Using standard monitoring tools
- It allows us to have information about the status of all infrastructure component in real time:
  - Networking
  - Servers
  - Services
- Essential to obtain KPI (Key Performance Indicator) and check SLA (Service Level Agreement)
- Preventive maintenance
- Connected to Service Management System, part of our implementation of FitSM
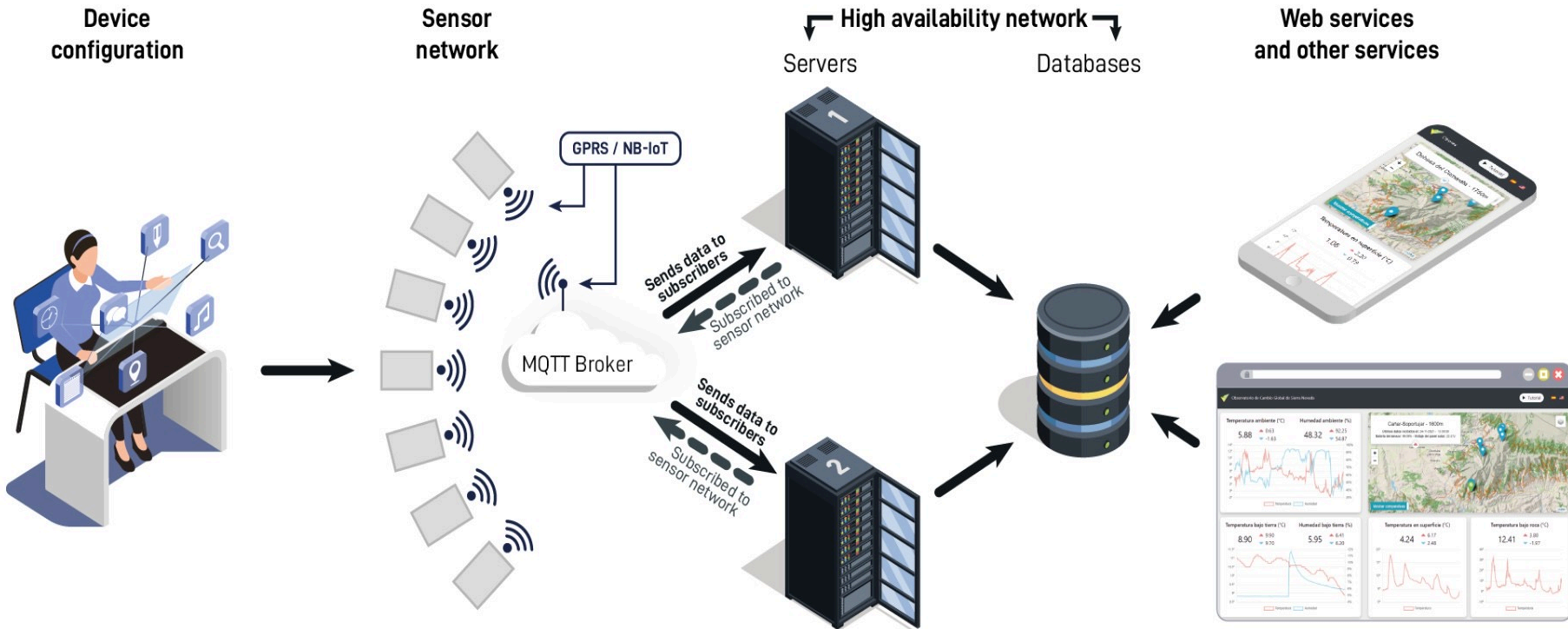

KPI

SLA
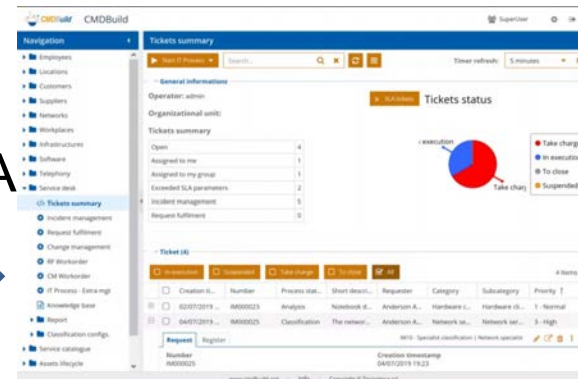
- FitSM is part of IT Industrialization plan for services provided by LifeWatch ERIC

- It is a lightweight IT service management with main design principle: Keep it simple!

- Supported on our specialized IT tools that manage:
  - Incidents
  - Changes
  - Problems
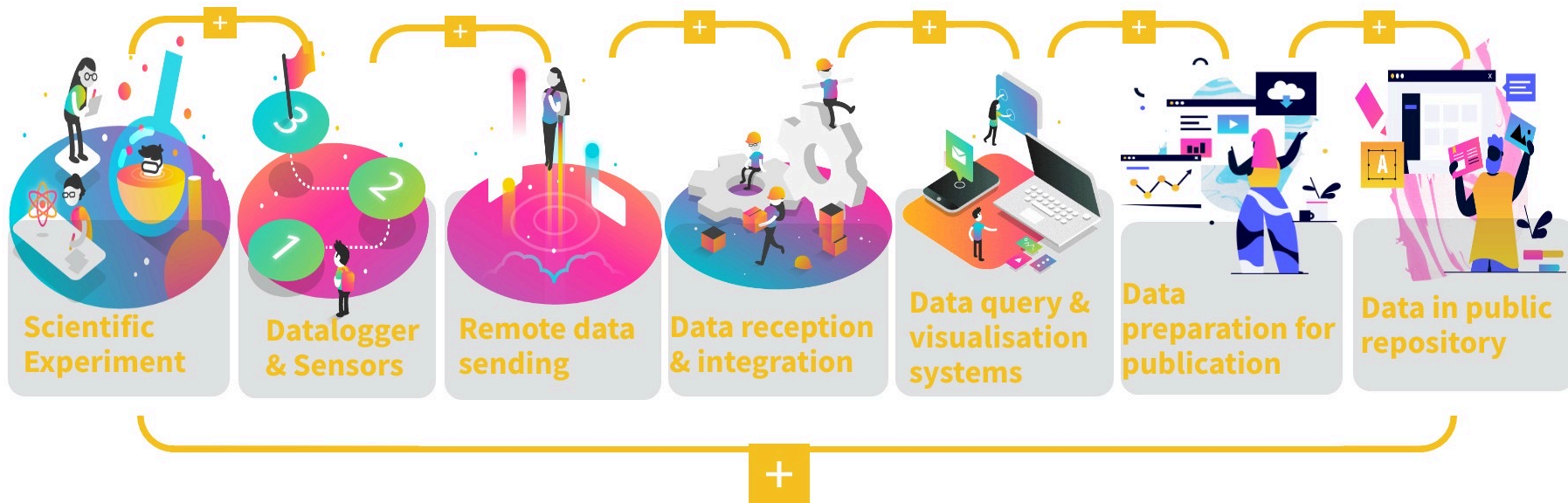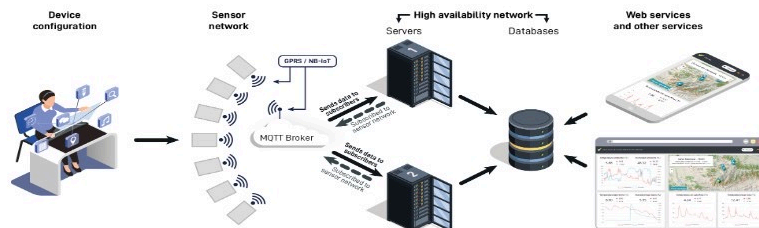 - SLA
  - CMDB
  - Service catalog

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Traditional IoT environmental monitoring cycle

Device configuration

Sensor network

High availability network

Servers Databases

Web services and other services

GPRS / NB-IoT

MQTT Broker

Sends data to subscribers

Subscribed to sensor network

Sends data to subscribers

Subscribed to sensor network

Traditional IoT environmental monitoring cycle

Scientific Experiment

Datalogger & Sensors

Remote data sending

Data reception & integration

Data query & visualisation systems

Data preparation for publication

Data in public repository

Improving the environmental monitoring cycle

Scientific Experiment

Register Form

Datalake +LifeBlock (Traceability with BlockChain)

Data & Metadata public repository with geonetwork and additional semantic search engine

1
Simplification of sensorisation process

2
Automatic integration of variables in datalake with traceability

3
Updating and cross-query of all variables in real time

4
Query, visualisation and semantic search systems. Data connection with virtual laboratories.

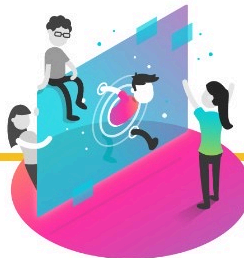# Improving the environmental monitoring cycle

Only Fill Form

Definition of variables, standard sensor connection interface and sensor type, sampling interval, etc. Definition of metadata.
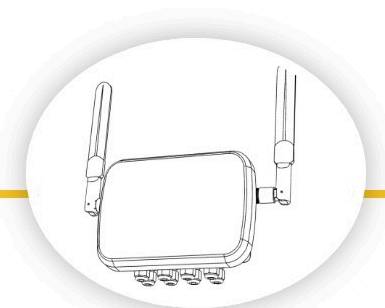
Datalogger

Automatic loading of programming in datalogger (locally or remotely). We only need to connect the sensor to the corresponding port

Integration

Automatic creation of MQTT broker parameters and FiWare subscriptor. Generating variables in **DATALAKE with trazability**. **Data integration in real time.**

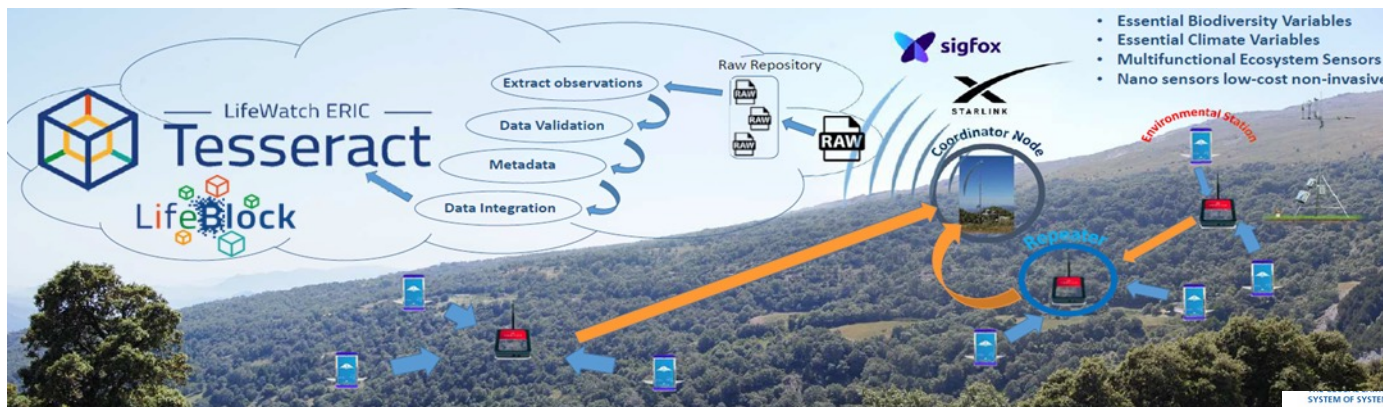### Monitoring

Monitoring of all sensors in real time and possibility of operating or reprogramming them remotely.
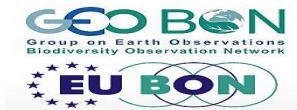
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Biodiversity, Remote Sensing & Space Technologies

- Importance of **UNDERSTANDING** what is going on **being based on DATA but also e-Services FAIRness**.

Biodiversity, Remote Sensing & Space Technologies
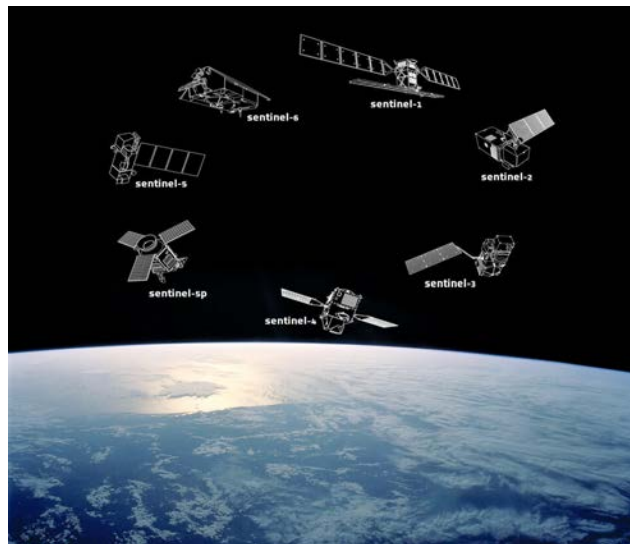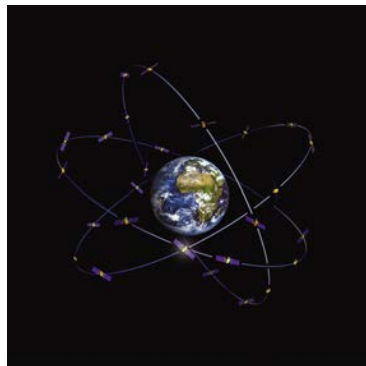
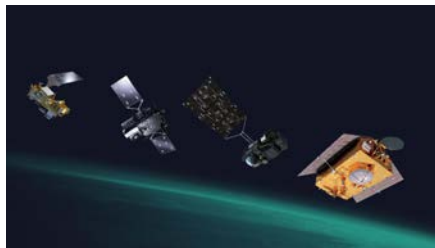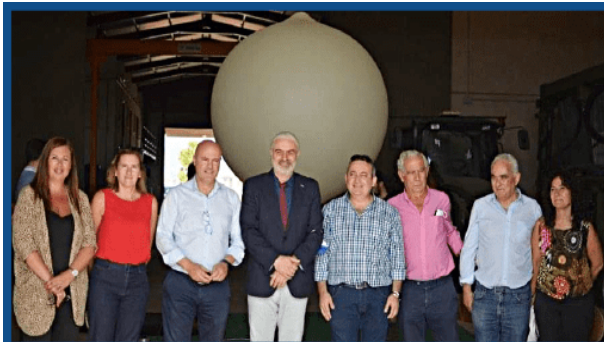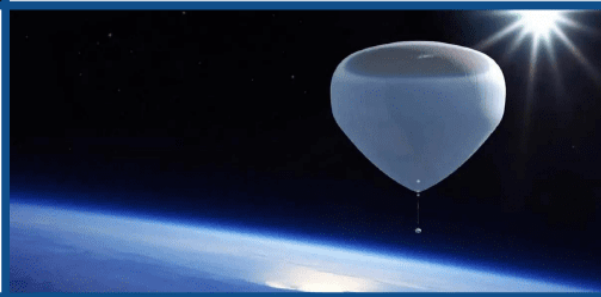# Biodiversity, Remote Sensing & Space Technologies
High Altitude Balloon Campaigns

Balloon Sensor Released to Collect Data on Agricultural Impacts

SmartFood Project Cordoba July 2022

- **High Altitude Balloon (20 kms altitude)**
- **Multisensors onboard**
- **Mission data stored onboard and telemetered**
- **Payload recovery**
- **Mission successful**

Biodiversity, Remote Sensing & Space Technologies
HAPS (High Altitude Pseudo Satellites)

- High Altitude (20 kms altitude)
- Heavier than air vs lighter than air
- Multisensors onboard
- Mission data stored onboard and telemetered
- Fuerteventura Stratoport
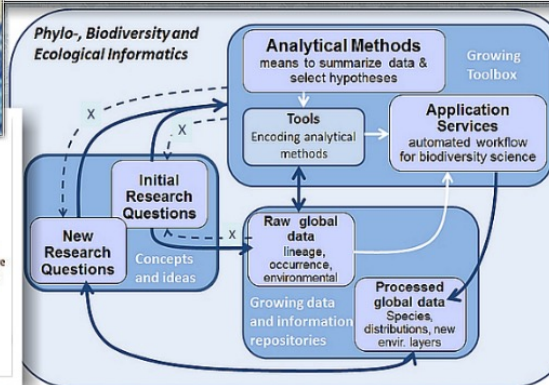- Different stages of testing (Zephyr, Stratobus, Skydweller, etc)

Biodiversity, Remote Sensing & Space Technologies
SmartFood Project
First Andalusian Earth Observation Nanosatellite

- Low Earth Orbit (500 kms altitude)
- Mission: ecosystems services monitoring (forestry, agricultural, biodiversity, etc)
- Nanosatellite
- Multispectral Payload (Very High Resolution Optical Payload)
- Launch 2023

Thanks!