This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 732064

This project is part of BDV PPP

# DataBio and Big Data Solutions for Agriculture

**Thanasis Poulakidas**

Intrasoft International

DataBio project coordinator

*"Digitising agriculture and food value chains" event*

*Brussels, 17 November 2017*

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# DataBio project info

*Project title:* Data-Driven Bioeconomy

*Project type:* H2020 Innovation Action, in topic ICT-15-2016-2017 - Big Data PPP: Large Scale Pilot actions in sectors best benefitting from data-driven innovation

*Duration:* 1 Jan. 2017 – 31 Dec. 2019 (36 months)

*Total budget:* 16,2 M€

*Partners:* 48 partners, 70+ associated partners

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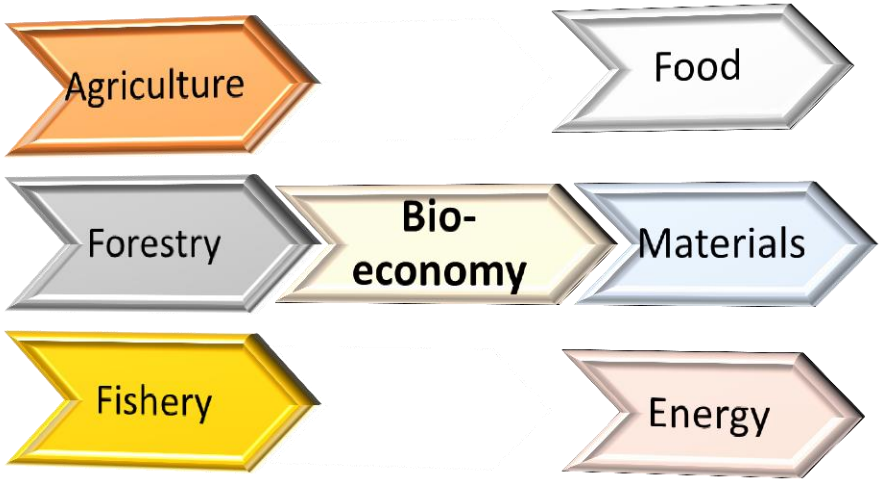
# Project objectives

- Industrial domain: **Bioeconomy**
  - Utilization of best possible raw materials from agriculture, forestry and fishery
  - Production of food, energy and biomaterials
- The opportunity: **Bioeconomy can benefit from Big Data**
  - Farm machines, fishing vessels, forestry machinery and remote and proximal sensors collect large quantities of data
  - Big data technologies process data and create knowledge that increases performance and productivity in a sustainable way




- Project objectives
  1. Build a **versatile DataBio platform** suitable for different industries and user profiles
  2. Ensure effective **utilization of existing data sets**
  3. Ensure a **wide-spread use** of the DataBio platform **technologies** in the agriculture, forestry and fishery sectors
  4. Opening the **possibilities for European ICT industry** including SMEs to participate actively on European and World Wide Bioeconomy Big Data market
  5. Opening the **possibilities for European Earth Observation industry** including SMEs offering their new Bioeconomy related services in Europe and World Wide

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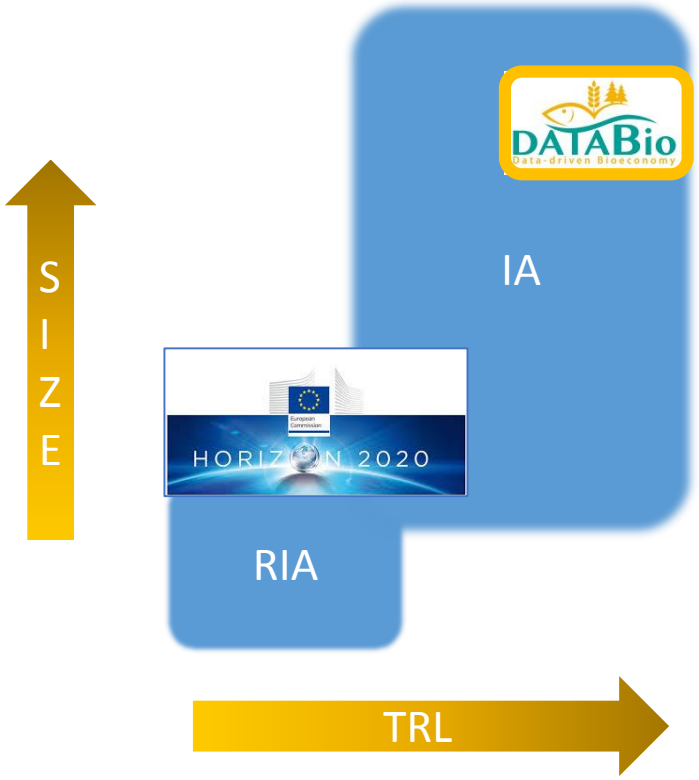
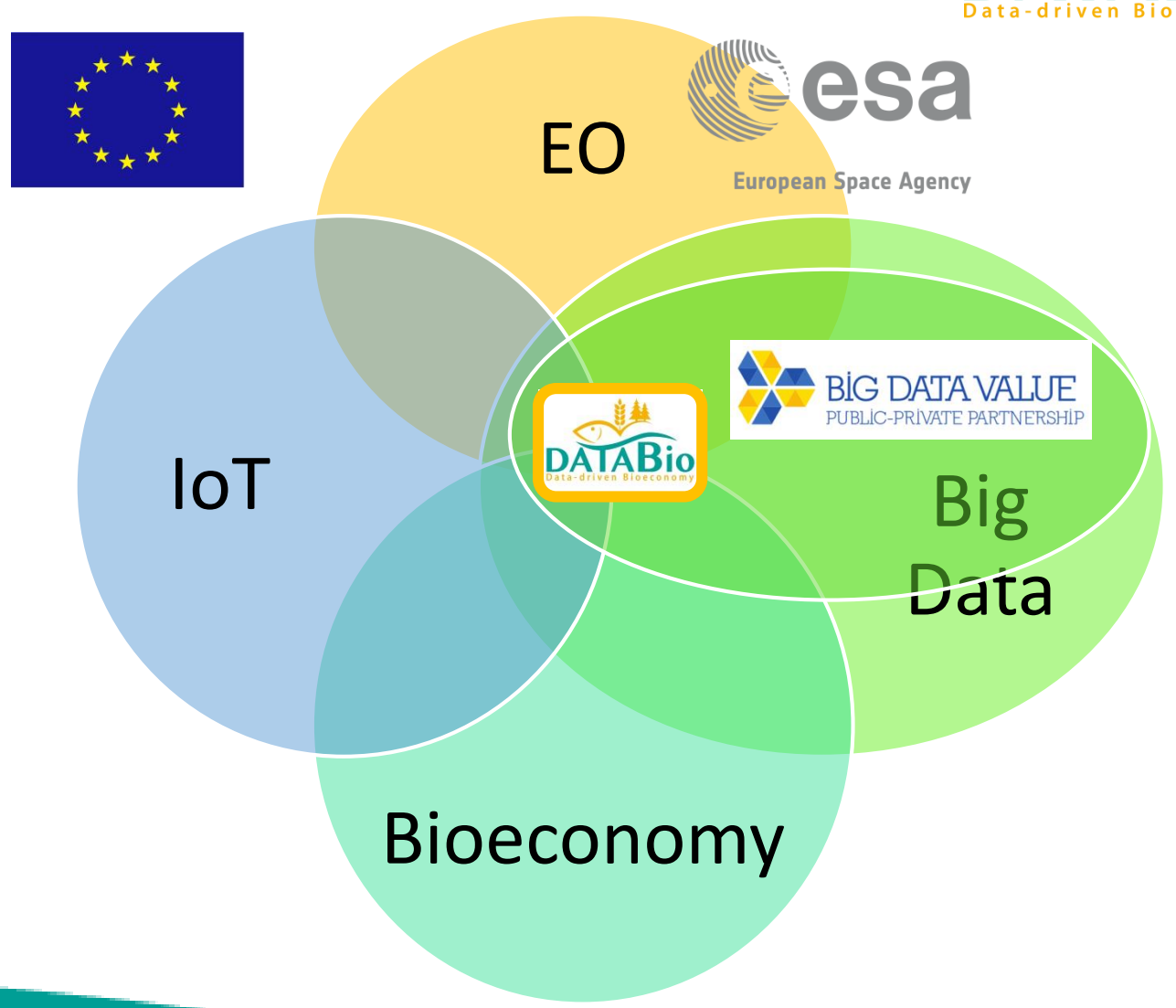
# DataBio: a lighthouse project positioning

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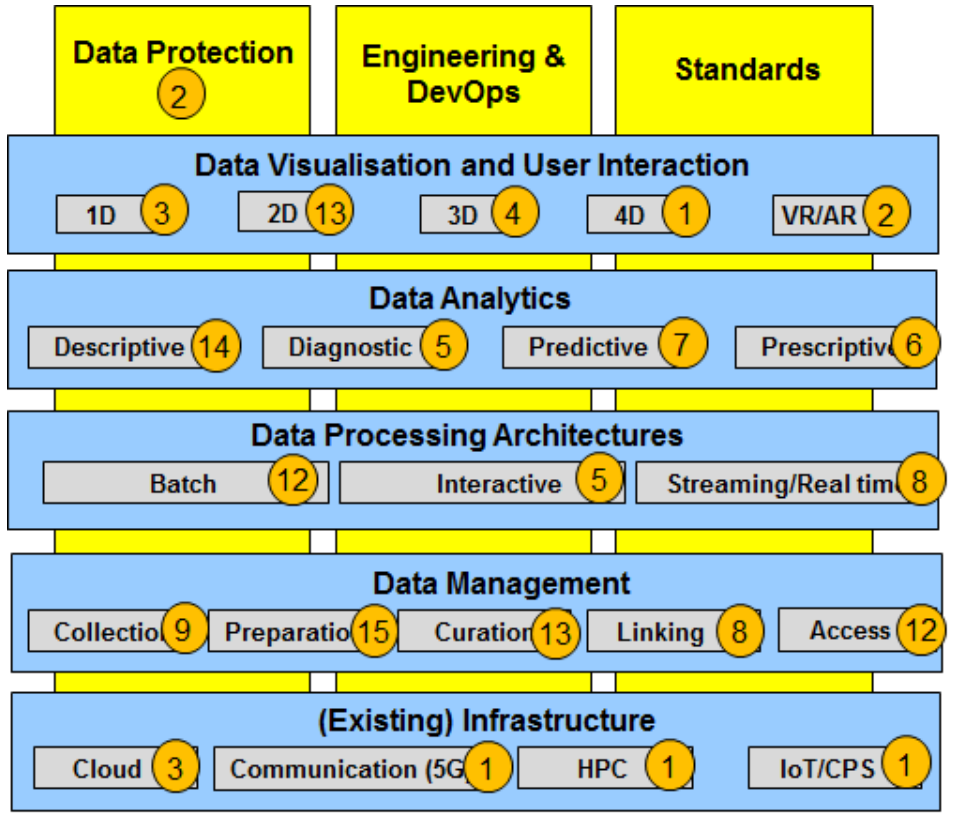
# Combining drivers and assets

***26 pilots, in 3 sectors x 3 thematic groups***

| Sector | Variety | Volume (TB) | Velocity (TB/Year) |
|---|---|---|---|
| Agriculture | 8 sources, 4 types | 53 | 197 |
| Forestry | 8 sources, 7 types | 11,39 | 12,12 |
| | Aerial/UAV | | 100 GB/h |
| Fishery | 20 sources, 13 types | 8,82 | 6,27 |

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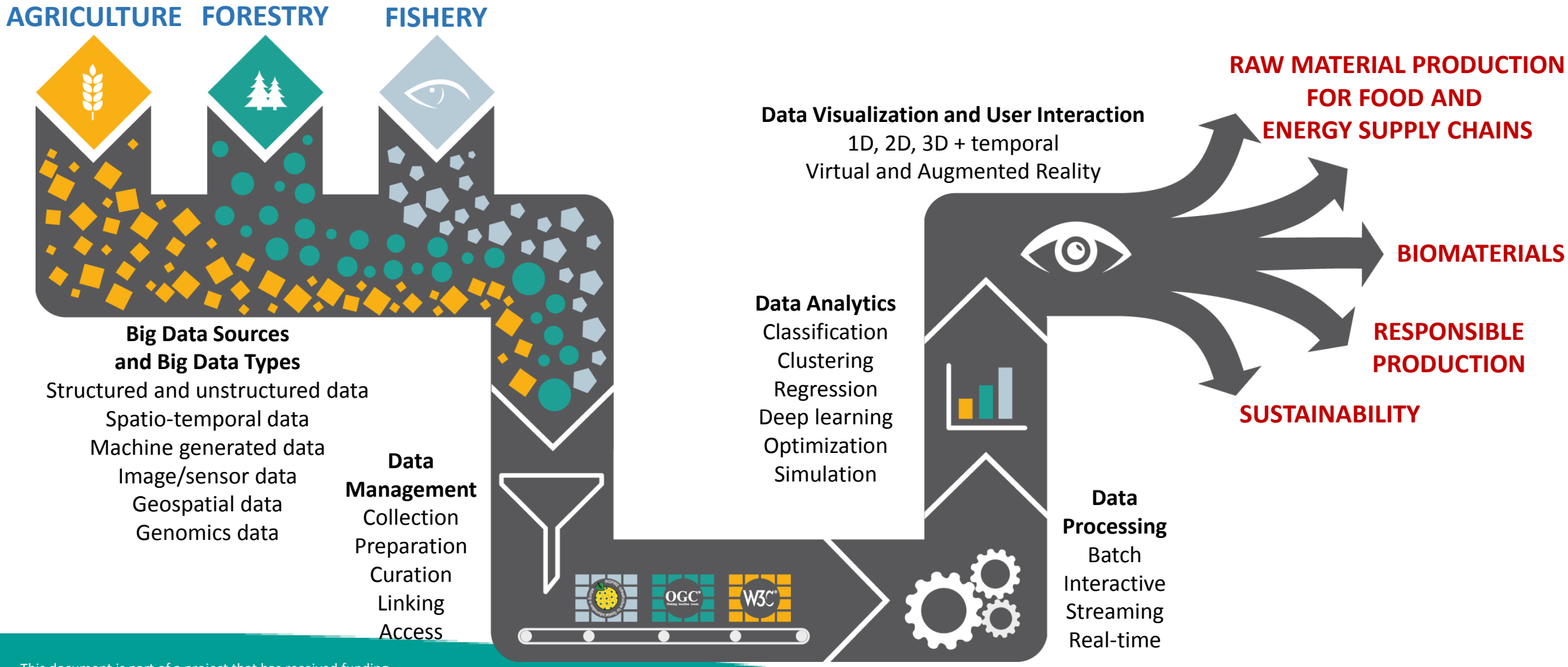
# Big picture and expected outcomes

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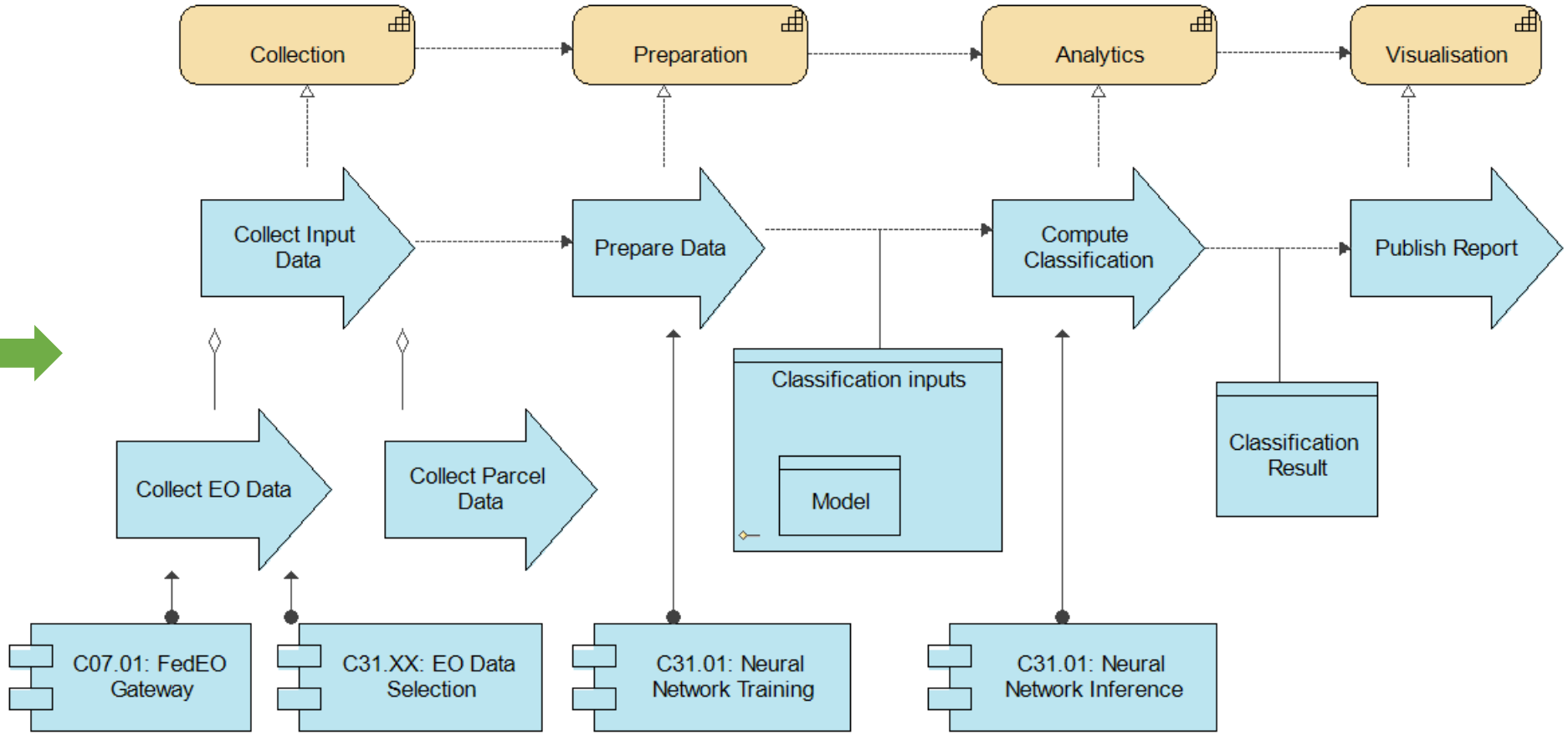
# Design scope

- Full Big Data **pipelines** of components
  - Example from precision agriculture pilot
- Shaping **common** pipelines and interfaces, driving the **DataBio platform** design

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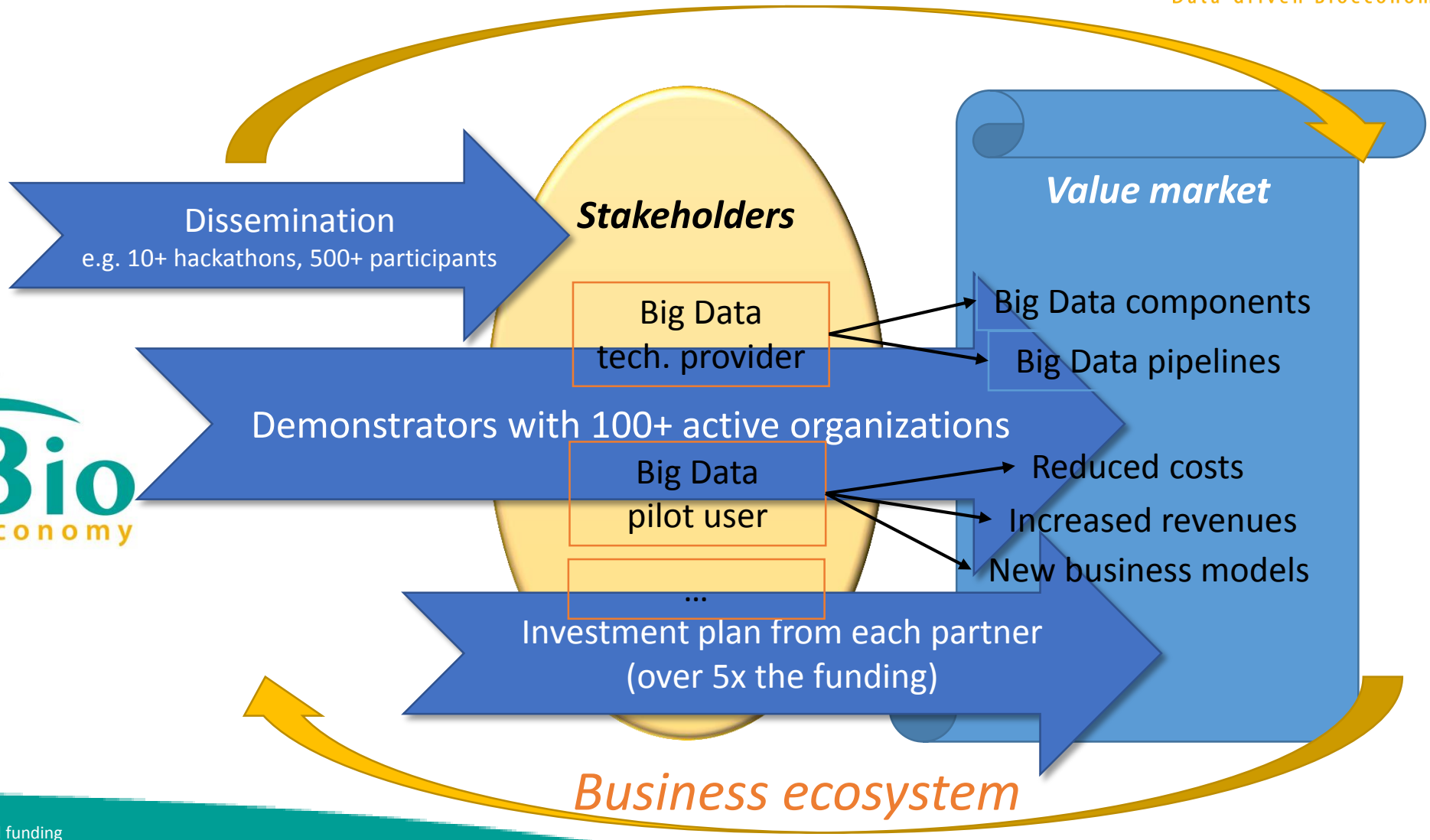
# Impact activities

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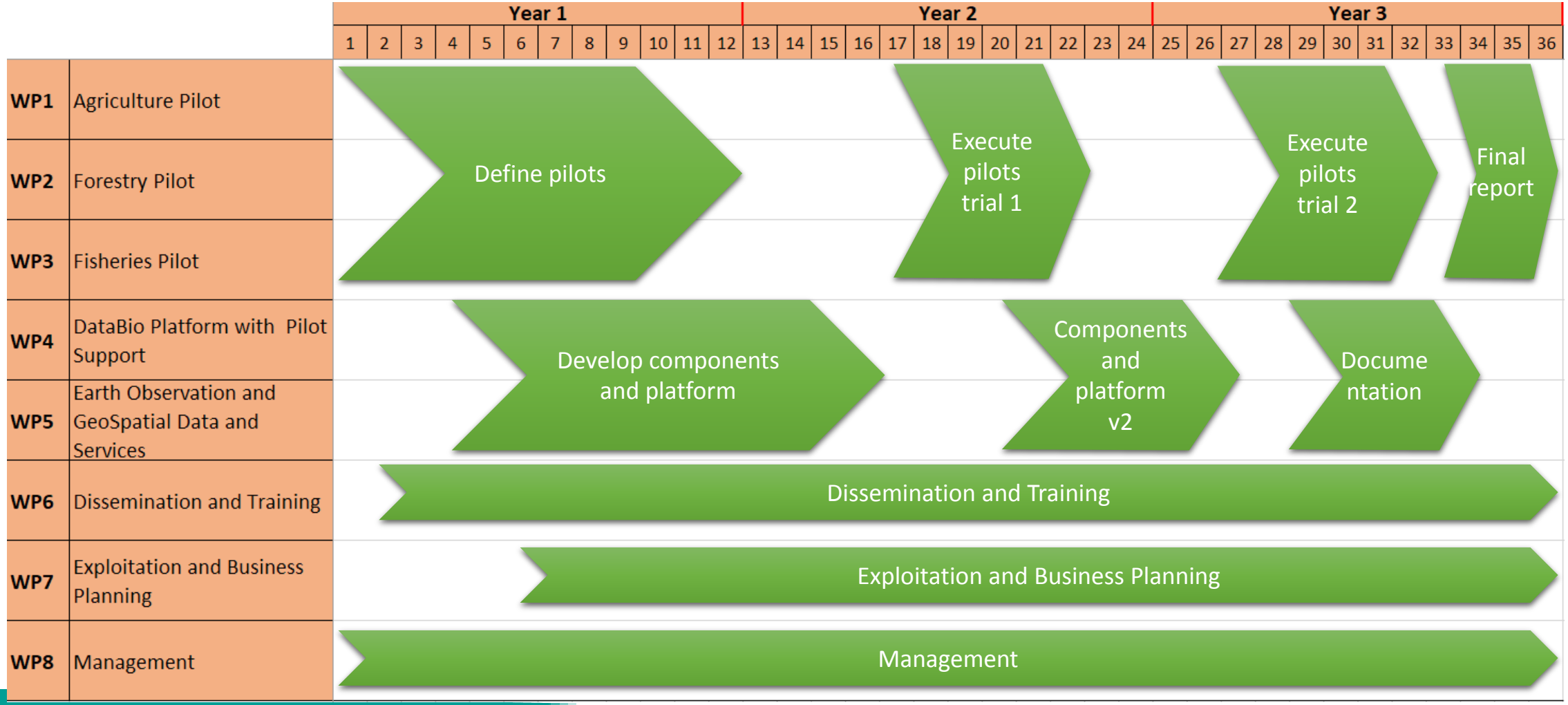
# Project implementation phases

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# Pilots

| | |
|---|---|
| **Precision Horticulture including vine and olives** | Precision agriculture in olives, fruits, grapes (@Greece) |
| | Precision agriculture in vegetable seed crops (@Italy) |
| | Precision agriculture in vegetables -2 (Potatoes, @Netherlands) |
| | Big Data management in greenhouse eco-systems (@Italy) |
| **Arable Precision Farming** | Cereals and biomass crops 1 (@Spain) |
| | Cereals and biomass crops 2 (@Greece) |
| | Cereals and biomass crops 3 (@Italy) |
| | Cereals and biomass crops 4 (@Czech Republic) |
| | Machinery management (@Czech Republic, Italy) |
| **Subsidies and insurance** | Insurance (@Greece) |
| | Farm Weather Insurance Assessment (@Italy) |
| | CAP Support (@Italy, Romania) |
| | CAP Support (@Greece) |

| | |
|---|---|
| **Multisource and data crowdsourcing /e-services** | Easy data sharing and networking |
| | Monitoring and control tools for forest owners |
| **Forest Health / Remote/Crowd sensing, Invasive species/damage** | Forest damage remote sensing |
| | Monitoring of forest health |
| | Invasive alien species control and monitoring |
| **Forest data management services (forecast/predict)** | Web-mapping service for the government decision making |
| | Shared multiuser forest data environment |

| | |
|---|---|
| **Fishing vessels immediate operational choices** | Oceanic tuna fisheries immediate operational choices |
| | Small pelagic fisheries immediate operational choices |
| **Fishing vessel trip and fisheries planning** | Oceanic tuna fisheries planning |
| | Small pelagic fisheries planning |
| **Fisheries sustainability and value** | Pelagic fish stock assessments |
| | Small pelagic market predictions and traceability |

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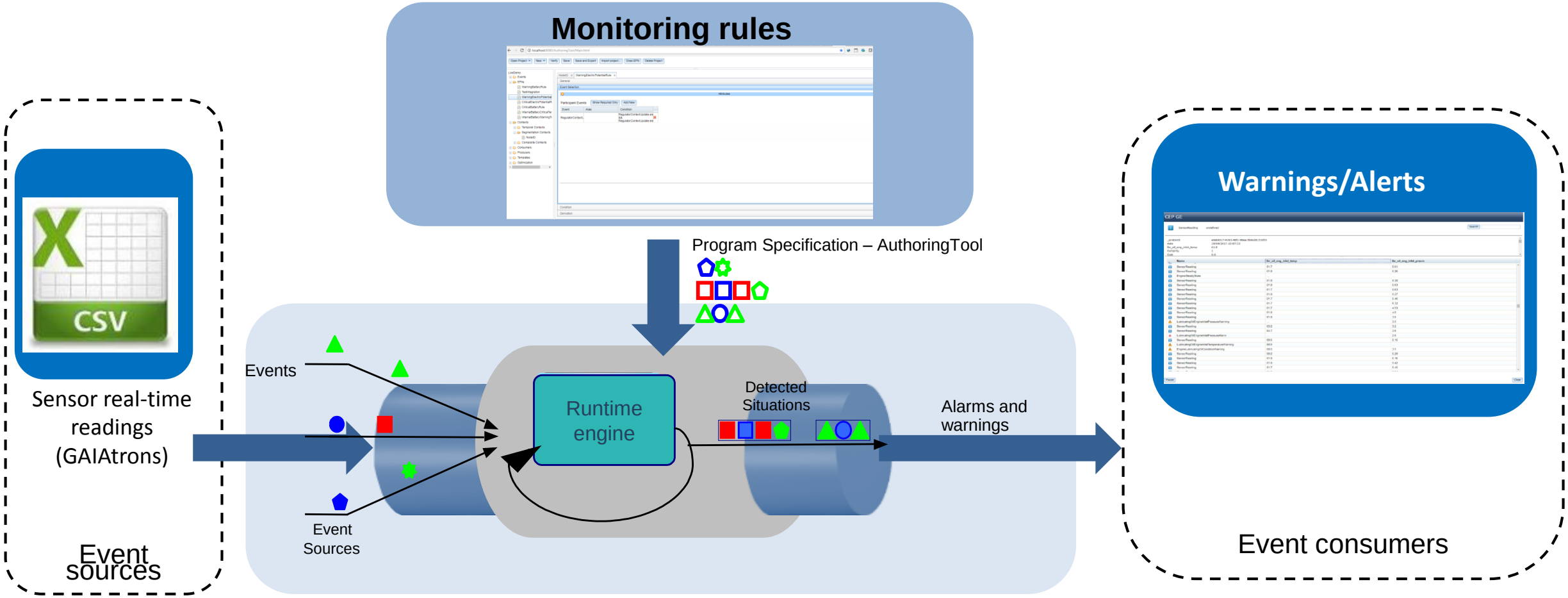
# Example of Big Data component use in a pilot

## Using PROTON for detecting crop diseases in Precision Agriculture

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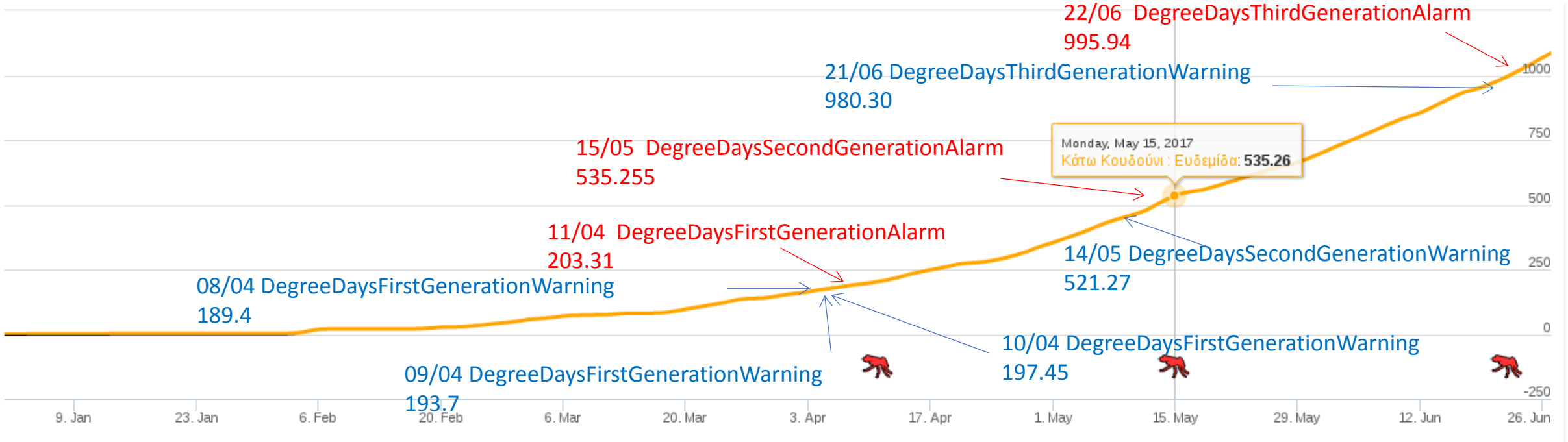
# Example (cont.): pest alert for grapes

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# Added value of using Big Data in agriculture

- **Currently** some high tech values are offered to farmers in a few nations for a number of crops:
  - new elite varieties
  - Big Data such as weather, soil, crop (phenotypic data), and other environmental data are routinely collected and meta-analyzed
  - farm telemetry or utilization of satellite data (Earth Observation)
  - technological and managerial services
- … but not with a big data analytics technology level
- **Big data analytics** can provide highly localized plans:
  - descriptive (better and more advanced way of looking at an operation)
  - prescriptive (timely recommendations for operation improvement, i.e. seed, fertilizer and other agricultural inputs application rates, soil analysis, and localized weather and disease/pest reports, based on real-time and historical data)
  - predictive (use current and historical data sets to forecast future localized events and returns)
- **The agriculture DataBio pilots will demonstrate** about a 30% productivity increase, which in 5 year perspective means more than a double annual growth rate
- The **DataBio results can be replicated** because
  - we use standard technologies and best practice solutions at all system levels
  - we account for both small and bigger farms, with agriculture data gathered art both a finer and a larger scale
- Big Data in agriculture is currently a **hot topic** worldwide, especially in the USA, and is heavily industry driven
- **Market gap**: currently there are no (or limited) Big Data based commercial services for agricultural professionals in several European countries

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# Thank you for your attention!

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