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

DATA B I O


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Intrasoft International
DataBio project coordinator

“Digitising agriculture and food value chains” event

Brussels, 17 November 2017
DataBio project info

Project title: Data-Driven Bioeconomy


Total budget: 16,2 M€

Partners: 48 partners, 70+ associated partners
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
Combining drivers and assets

26 pilots, in 3 sectors x 3 thematic groups

<table>
<thead>
<tr>
<th>Sector</th>
<th>Variety</th>
<th>Volume (TB)</th>
<th>Velocity (TB/Year)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Agriculture</td>
<td>8 sources, 4 types</td>
<td>53</td>
<td>197</td>
</tr>
<tr>
<td>Forestry</td>
<td>8 sources, 7 types</td>
<td>11,39</td>
<td>12,12</td>
</tr>
<tr>
<td></td>
<td>Aerial/UAV</td>
<td></td>
<td>100 GB/h</td>
</tr>
<tr>
<td>Fishery</td>
<td>20 sources, 13 types</td>
<td>8,82</td>
<td>6,27</td>
</tr>
</tbody>
</table>

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Big picture and expected outcomes

Big Data Sources and Big Data Types
- Structured and unstructured data
- Spatio-temporal data
- Machine generated data
- Image/sensor data
- Geospatial data
- Genomics data

Data Management
- Collection
- Preparation
- Curation
- Linking
- Access

Data Processing
- Batch
- Interactive
- Streaming
- Real-time

Data Analytics
- Classification
- Clustering
- Regression
- Deep learning
- Optimization
- Simulation

Data Visualization and User Interaction
- 1D, 2D, 3D + temporal
- Virtual and Augmented Reality

RAW MATERIAL PRODUCTION FOR FOOD AND ENERGY SUPPLY CHAINS
- BIOMATERIALS
- RESPONSIBLE PRODUCTION
- SUSTAINABILITY
Design scope

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

**Stakeholders**

- Big Data tech. provider
- Big Data pilot user
- ...

**Value market**

- Big Data components
- Big Data pipelines
- Reduced costs
- Increased revenues
- New business models

**Dissemination**

e.g. 10+ hackathons, 500+ participants

**Demonstrators with 100+ active organizations**

**Investment plan from each partner**

(over 5x the funding)

**Business ecosystem**
### Project implementation phases

<table>
<thead>
<tr>
<th>Year 1</th>
<th>Year 2</th>
<th>Year 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**WP1** Agriculture Pilot

- **Define pilots**
  - Year 1: 1-5
  - Year 2: 6-10
  - Year 3: 11-15

**WP2** Forestry Pilot

- **Execute pilots trial 1**
  - Year 1: 16-20
  - Year 2: 21-25
  - Year 3: 26-30

**WP3** Fisheries Pilot

- **Execute pilots trial 2**
  - Year 1: 31-35
  - Year 2: 36-40
  - Year 3: 41-45

**WP4** DataBio Platform with Pilot Support

- **Components and platform v2**
  - Year 1: 1-5
  - Year 2: 6-10
  - Year 3: 11-15

**WP5** Earth Observation and GeoSpatial Data and Services

- **Documentation**
  - Year 1: 16-20
  - Year 2: 21-25
  - Year 3: 26-30

**WP6** Dissemination and Training

- **Dissemination and Training**
  - Year 1: 1-5
  - Year 2: 6-10
  - Year 3: 11-15

**WP7** Exploitation and Business Planning

- **Exploitation and Business Planning**
  - Year 1: 16-20
  - Year 2: 21-25
  - Year 3: 26-30

**WP8** Management

- **Management**
  - Year 1: 1-5
  - Year 2: 6-10
  - Year 3: 11-15
## Pilots

<table>
<thead>
<tr>
<th>Category</th>
<th>Description</th>
</tr>
</thead>
</table>
| **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 (@Italy) |
| **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 |

**Multisource and data crowdsourcing / e-services**  
Easy data sharing and networking  
Monitoring and control tools for forest owners  
Forest damage remote sensing  
Monitoring of forest health  
Invasive alien species control and monitoring  
Web-mapping service for the government decision making  
Shared multiuser forest data environment
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
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 at 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
Thank you for your attention!

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