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Data Driven Bioeconomy (DataBio)

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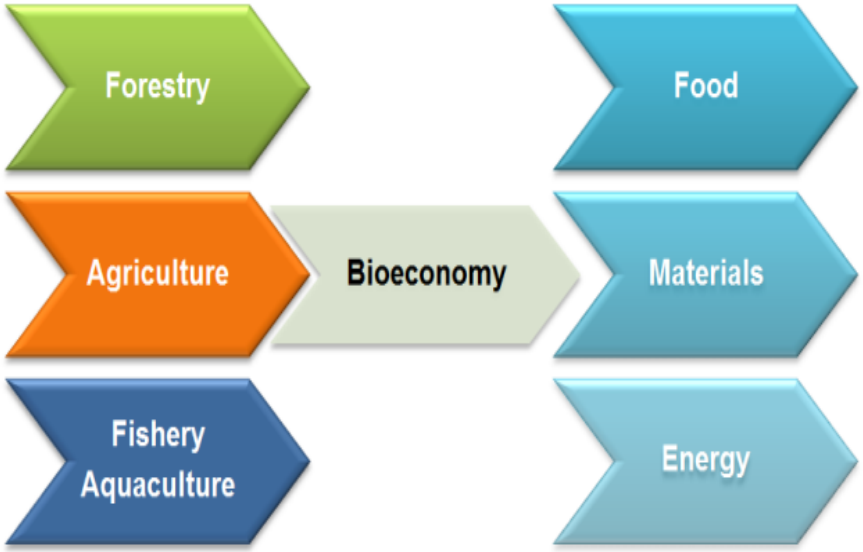
Outline

- The project in a nutshell
- Concept and approach
- Data assets
- Linkage to industrial plans of partners
- Conclusions and way forward

The project in a nutshell

- **The industrial domain addressed**
  - **Bioeconomy**
    - Utilization of best possible raw materials from agriculture, forestry and fishery
    - Production of food, energy and biomaterials

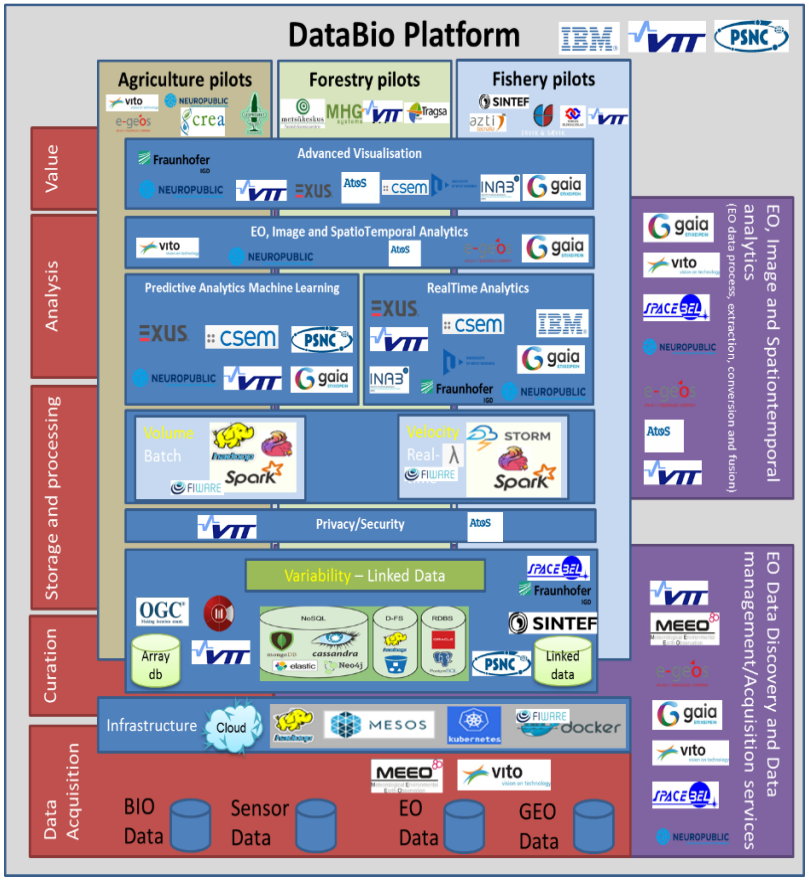


- **The current landscape**
  - **Few large ICT vendors so far**
  - **Small market share of Big Data technology providers**
  - **Restricted use of Big Data**
  - **Restricted productivity**

- **The opportunity**
  - **Bioeconomy can benefit from Big Data**
    - Farm machines, fishing vessels, forestry machinery and remote and proximal sensors collect large quantities of data.
    - Large scale data collection and collation enhances knowledge to increase performance and productivity in a sustainable way.

Concept and approach

- **Current limitations**
  - Big Data sets (e.g., Copernicus Earth monitoring infrastructure) are heterogeneous, can be unstructured, hard to analyze and distributed across various sectors and different providers.
  - Often valuable data is measured for real time use in specialized systems, but not stored for later processing or recorded in a way suitable for data collation across individual systems.
  - In addition, Big Data will be exponentially created, processed and stored in the coming years, but no single infrastructure can do the job alone.



To address these issues, DataBio proposes to deploy a state of the art, interoperable big data platform on top of the existing Partners' infrastructure in order to enable users with different profiles to fully benefit from the underlying High Processing capabilities.

Data assets (1/3)

- Agriculture pilot

Source	Type	Volume (TB)	Velocity (TB/Year)
Sentinel 1/2 data	Greek Mosaic	16	40
Sentinel 1/2 data	Czech Mosaic	1,6	5
Sentinel 1/2 data	Italian Mosaic	12	50
Sentinel 1/2 data	Spain mosaic	18	60
Machinery Monitoring	Czech Republic (Lesprojekt Zetor)	3	10
Sensors measurement	Greek measurement	4	30
Sensor measurement	Czech Republic	0,1	2
Total	(TB)	53	197

Data assets (2/3)

- Forestry pilot

Source	Type	Volume (TB)	Velocity (TB/year)
SENTINEL-1/2A&B	3-day image mosaic / forest Czech Reb	1.6	4.4
SENTINEL-1/2A&B	10-day image mosaic / forest Czech Reb	0.48	1.32
SENTINEL-1A&B	Satellite image data / forest Spain	3.17	3.17
SENTINEL-2A&B	Satellite image data / forest Spain	1.44	1.44
Metsään.fi database	National forest resource database Finland	1.00	0.50
Finnish Forest Centre	Forest canopy hight model	1.10	0.22
Finnish Forest Centre	Drainage basin data	1.70	0.17
Finnish Forest Centre	Aerial image data	0.90	0.90
Total	(TB)	11.39	12.12

Source	Type	Volume (TB)	Velocity (TB/year)
Senop Oy aerial/UAV measurem.	Hyperspectral remote sensing imaging		100 GB/h

Data assets (3/3)

These numbers do not yet include data logging from sensors like cameras, radars, sonars and hydroacoustic instruments that each create high data volumes (TBs per month per sensor).

- **Fisheries pilot**

Source	Type	Volume (TB)	Velocity (TB/year)
Ervik & Saevik	Operational data	60.17	30.09
Ervik & Saevik	Motion data	45.41	22.71
Kings Bay	Operational data	35.95	17.98
Kings Bay	Motion data	45.41	22.71
Eros	Operational data	34.82	17.41
Eros	Motion data	45.41	22.71
Heroyhav	Operational data	28.19	28.19
Heroyhav	Motion data	45.41	22.71
Echebastar fleet	FAD/Buoys data	73.12	24.37
Echebastar fleet	Engine sensors	13.28	6.64
Echebastar fleet	VMS	0.01	0.00
Echebastar fleet	AIS	0.34	0.17
Echebastar fleet	Logbooks	0.00	0.00
Echebastar fleet	Observers	0.01	0.00
Spanish Ministry – MAGRAMA	All the first sale notes issued in fisheries auctions	225.00	225.00
Spanish Ministry – MAGRAMA	Fishing activities of vessels over 10 metres length overall	120.00	58.00
Spanish Ministry – MAGRAMA	Fishing vessels geographical positions for vessels over 12 meters length overall	550.00	270.00
Spanish Ministry – MAGRAMA	Fishing vessels characteristics	1.00	0.30
Total	(TB)	**1.32**	**0.77**

Local measurements

Source	Type	Volume (TB)	Velocity (TB/year)
Earth observation	Geolocated Raster	2.50	0.50
Earth models	Geolocated Raster	5.00	5.00
Total	(TB)	**7.50**	**5.50**

Remote measurements

Linkage to industrial plans of partners

- **Setting the scene for industrial exploitation**
  - Ensure a wide-spread use of the DataBio platform technologies in the 3 pilot sectors
    - Big Data demonstrations with at least 100 organizations participating actively
    - Companies from primary production will be involved
    - Participation of machinery producers, forest and wood companies, vessel and fishing companies
  - Open the possibilities for European ICT industry including SMEs to participate actively in the bioeconomy Big Data market
    - >10 Hackathons with 500 participants
    - >2 hackathons outside Europe

- **Existing industrial exploitation plans with KPIs for measuring their achievement**
  - European Earth Observation industry including SMEs will be enabled to offer new Bioeconomy services
    - Earth Observation demonstrations with at least 25 EO organizations participating actively will introduce their innovative EO services
    - >10 hackathons with 100 organizations
    - >2 hackathons outside Europe offering EO solution
  - Ensure interoperability and easy setup of new multivendor applications utilizing Big DataBio platform
    - New ideas and demos will be selected and integrated to the Pilots during the project.
    - New/re-used interoperable data models for sharing of data
    - OGC, W3C, Cloud and ISO services will be supported

Conclusions and way forward

- **Databio plans to be achieved**
  - Demonstrate increase of **productivity in bioeconomy**
  - Increase of **market share of Big Data technology providers** in the bioeconomy sector
  - More than **double the use of Big Data technology** in bioeconomy
  - Leveraging additional target sector **investments** by a factor of >5
  - More than **100 organizations in demonstrations**
  - Liaison with other **big data PPPs**
  - Closely **working with BDVA**

DataBio Project

- Total budget= 16,2 M€
- 48 partners, 10 of which are BDVA members
- 71 Associate partners (LoI)
- Duration: 01/01/2017 – 31/12/2019

Thank you for your attention!

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