

Health



Food & Agriculture



Energy



Transport



Climate



Social Sciences



Security

BIG DATA EUROPE

Empowering Communities
with Data Technologies

BIG DATA EUROPE H2020 CSA (2015-17)

7.9.2016



EDF 2016

*Integrating Big Data, Software & Communities for Addressing
Europe's Societal Challenges*



Big Data in Marketing







Big Data in Intelligence

TOP SECRET//SI//ORCON//NOFORN

Hotmail[®] Google[®] Skype[®] paltalk.com[®] YouTube[®]

Gmail[™] facebook[™] YAHOO![™] AOL[™] mail[™]

 (TS//SI//NF) **PRISM Collection Details** 

Current Providers

- Microsoft (Hotmail, etc.)
- Google
- Yahoo!
- Facebook
- PalTalk
- YouTube
- Skype
- AOL
- Apple

What Will You Receive in Collection (Surveillance and Stored Comms)?
It varies by provider. In general:

- E-mail
- Chat – video, voice
- Videos
- Photos
- Stored data
- VoIP
- File transfers
- Video Conferencing
- Notifications of target activity – logins, etc.
- Online Social Networking details
- **Special Requests**

Complete list and details on PRISM web page:
Go PRISMFAA

TOP SECRET//SI//ORCON//NOFORN



Big Data Europe (CSA: 2015-17)

- ⊙ **Show** societal value of Big Data: 7 Domains



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- ⊙ **Lower** barrier for using big data technologies

- Required effort and resources
- Limited data science skills

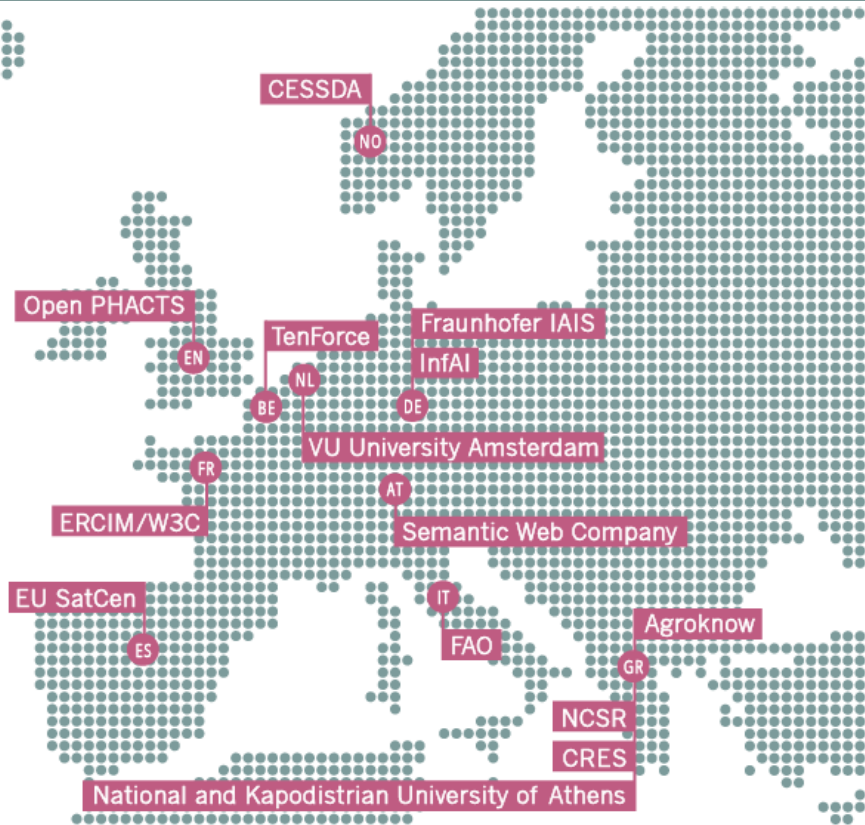
- ⊙ **Help** establishing cross-lingual/organizational/domain Data Value Chains



Consortium

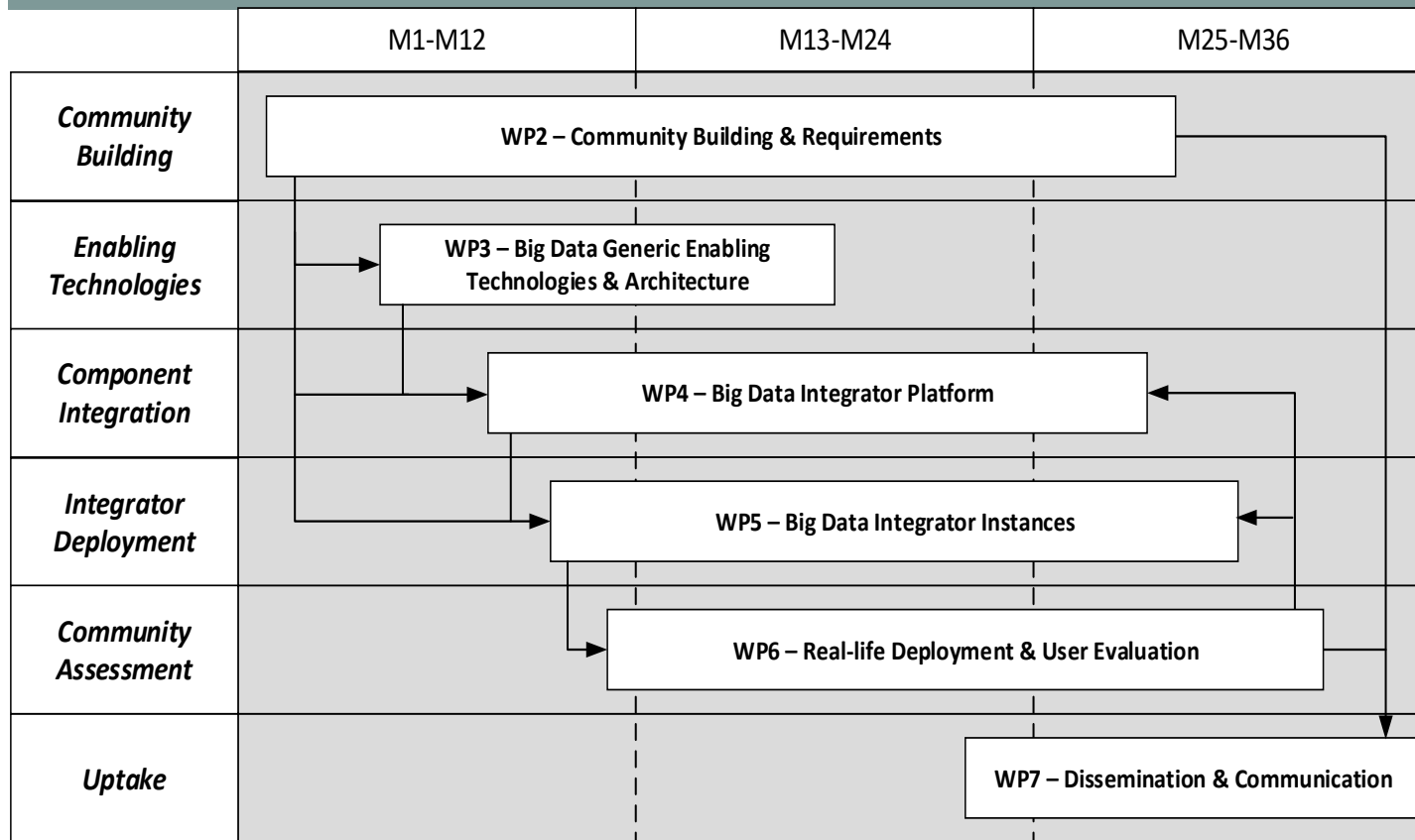


cessda



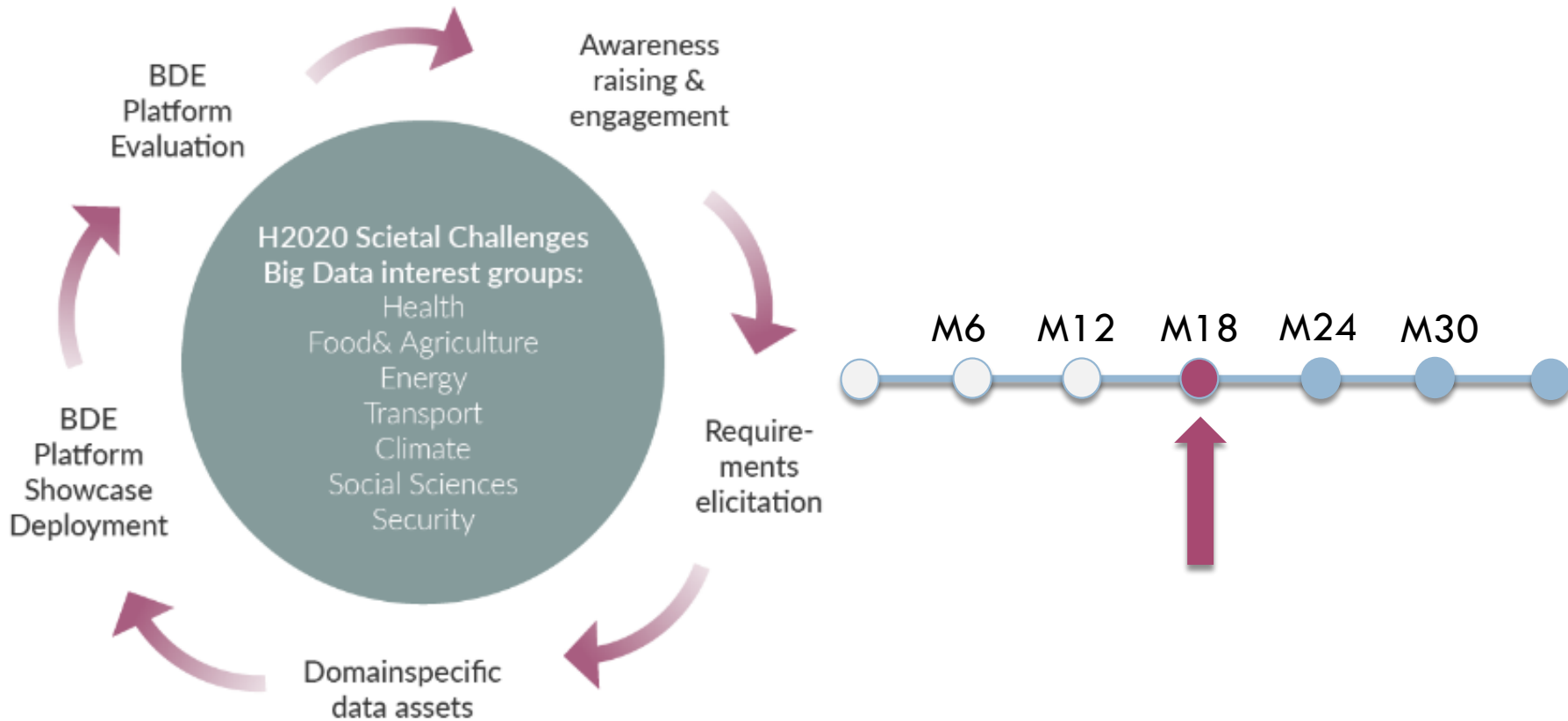


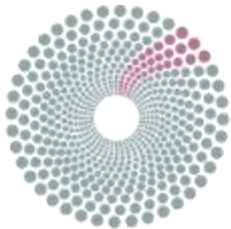
Project Overview





Stakeholder Engagement & Activities





Health



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ARCHITECTURE & COMPONENTS



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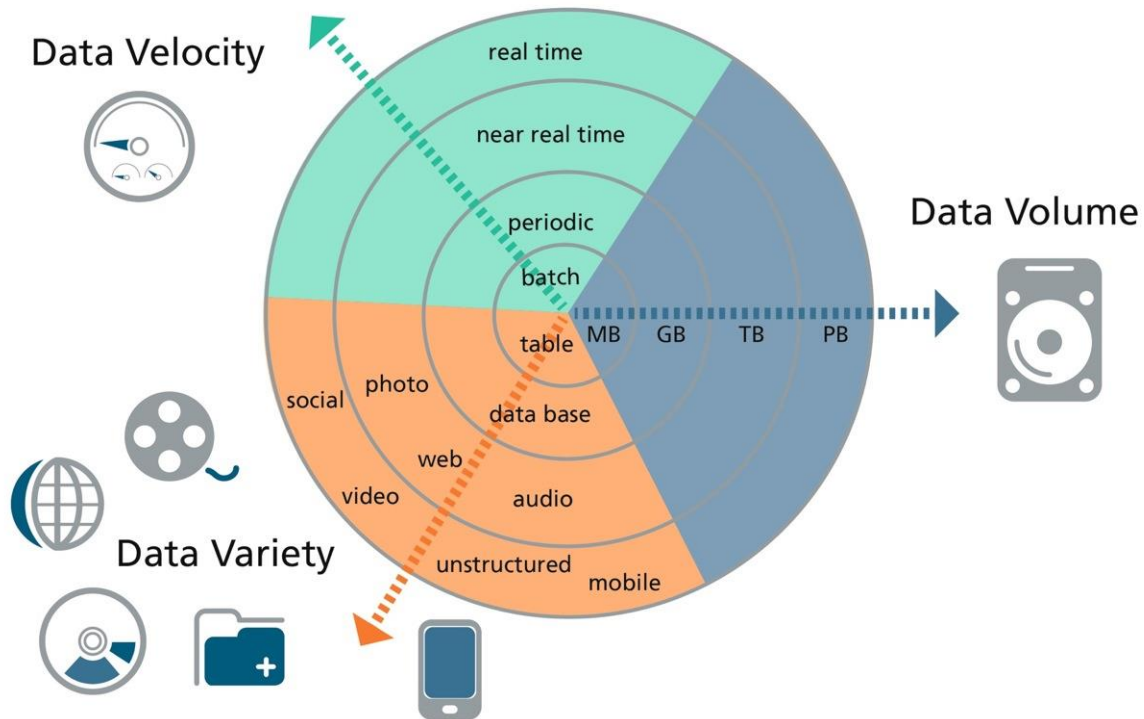


The three Big Data „V“

Variety is often neglected

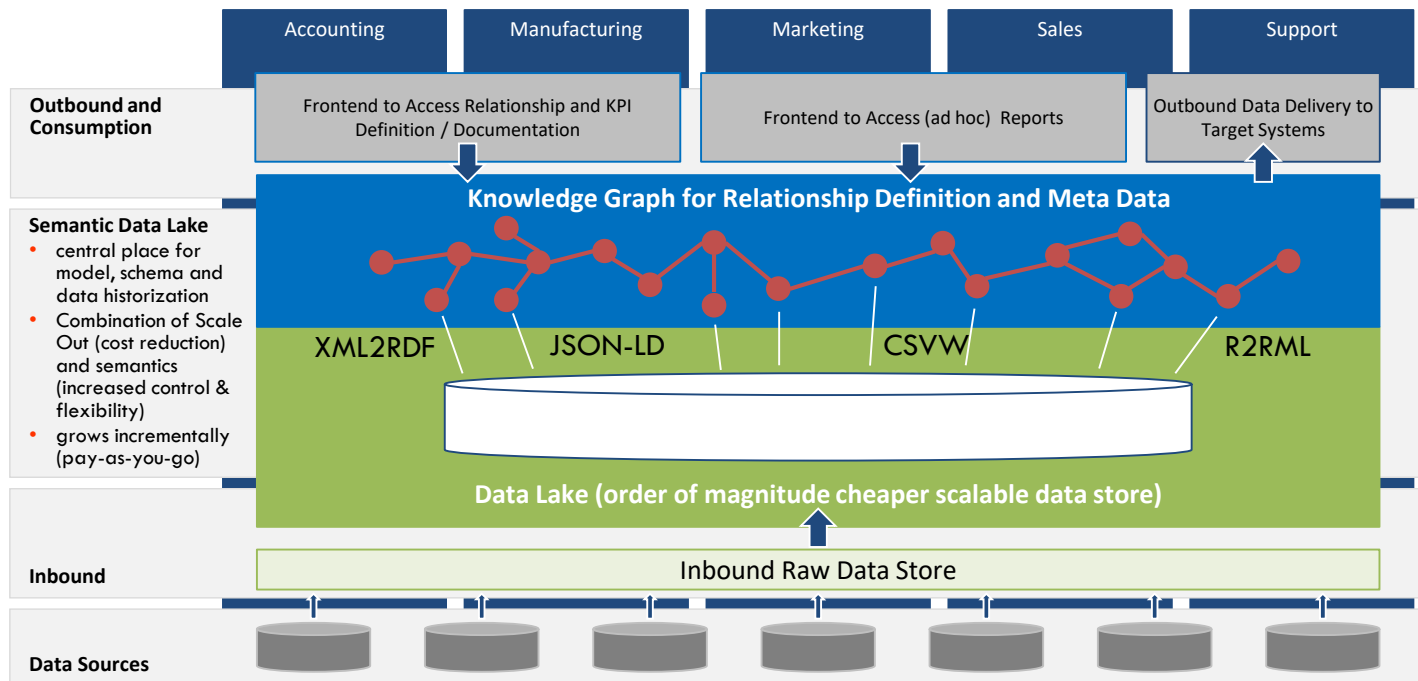


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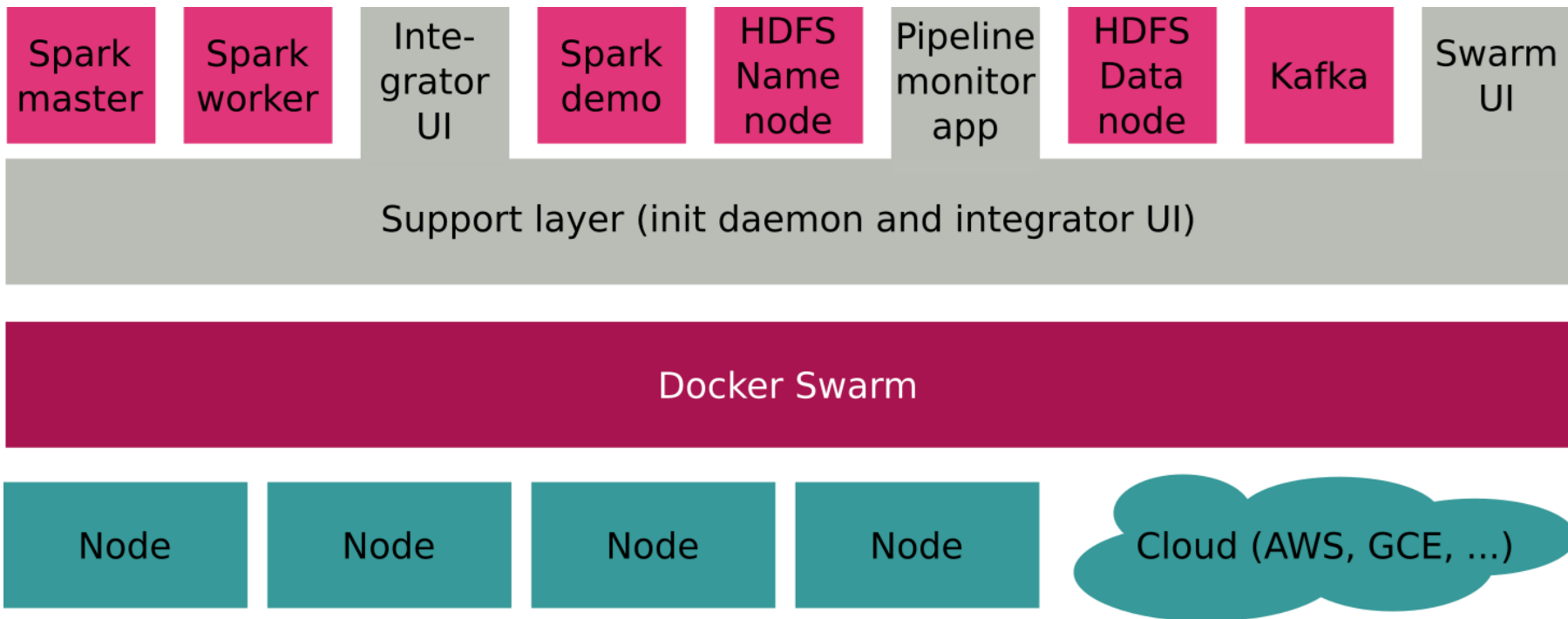


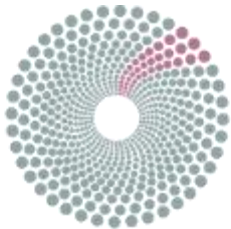
Adding a Semantic Layer to Data Lakes





Current State of Platform Architecture





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7 SC-PILOT INSTANTIATIONS



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Pilots: Overview

⊙ SC1: Health & Pharm.



⊙ SC2: Food & Agr.



⊙ SC3: Energy



⊙ SC4: Transport



⊙ SC5: Climate



⊙ SC6: Social Sciences



⊙ SC7: Security





SC1: Life Sciences & Health



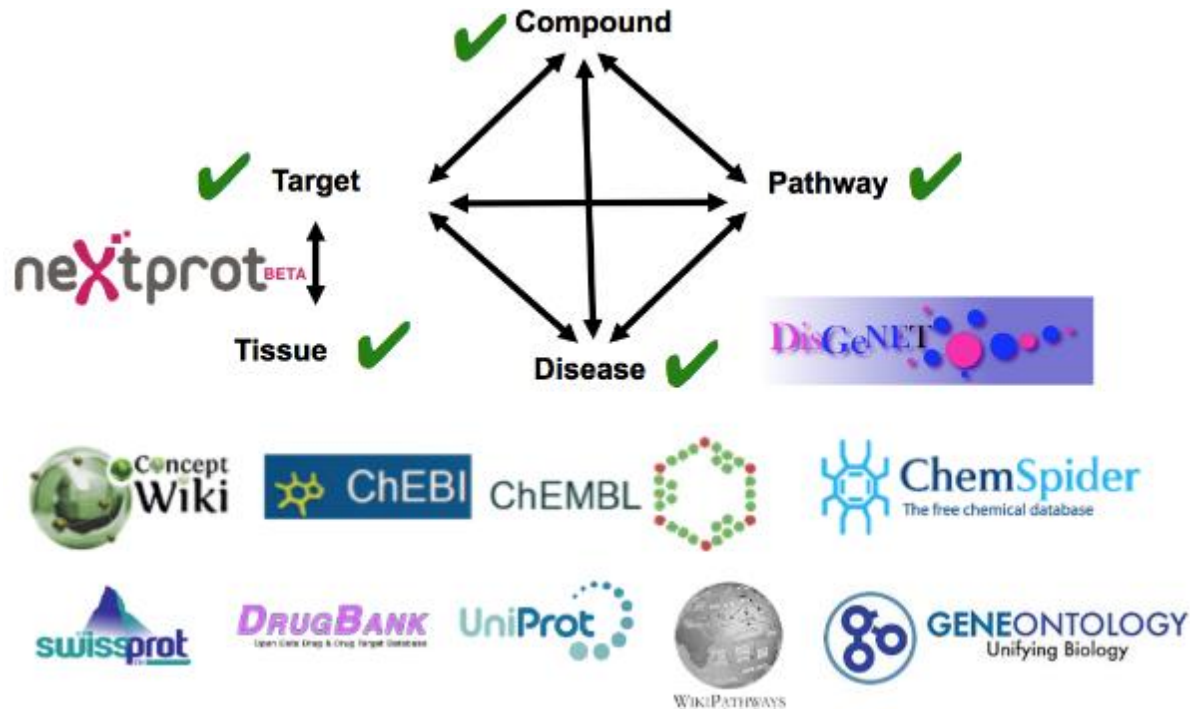
SC1: Life Sciences & Health



SC1: Life Sciences & Health

Big Data Focus area: Large-scale heterogeneous pharmaceutical research data linking & integration

Selected Key Data assets: ACD Labs / ChemSpider, ChEBI, ChEMBL, ConceptWiki, DrugBank, ENZYME, Gene Ontology, GO Annotation, SwissProt, WikiPathways





SC1: Life Sciences & Health

Pilot 1: Replicate Open PHACTS functionality on the BDE infrastructure using Open Source solutions

Reasons:

- Deployment possible in-house
- Apply to other domains (e.g. Agriculture)
- Using extra BDE functionalities (e.g. logging, analysis)

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Open PHACTS pgroth

Developer Home | Want help? | Documentation | Get my API keys | Featured Apps

Search

OpenPHACTS v1.4 API Active Docs

The response template for each operation colour coded as follows:

- Required elements that always return a single value
- Required elements that return either a single value or an array
- Optional elements that always return a single value
- Optional elements that return either a single value or an array

Operations

OpenPHACTS API v1.4

Compound Information	/compound	GET
Compound Information: Batch	/compound/batch	GET
Compound Class Members: Count	/compound/members/count	GET
Compound Class Members: List	/compound/members/pages	GET
Compound Classifications	/compound/classifications	GET
Classification of Targets for Compound	/compound/classificationsForTargets	GET
Compound Pharmacology: Count	/compound/pharmacology/count	GET
Compound Pharmacology: List	/compound/pharmacology/pages	GET
Compound Class Pharmacology: Count	/compound/tree/pharmacology/count	GET
Compound Class Pharmacology: List	/compound/tree/pharmacology/pages	GET



SC2: Food & Agriculture



SC2: Food & Agriculture



SC2: Food & Agriculture

AGINFRA

Big Data Focus area:
Large-scale distributed
agricultural data
integration

Selected Key Data assets:

INFOODS, AQUASTAT

Green Learning Network

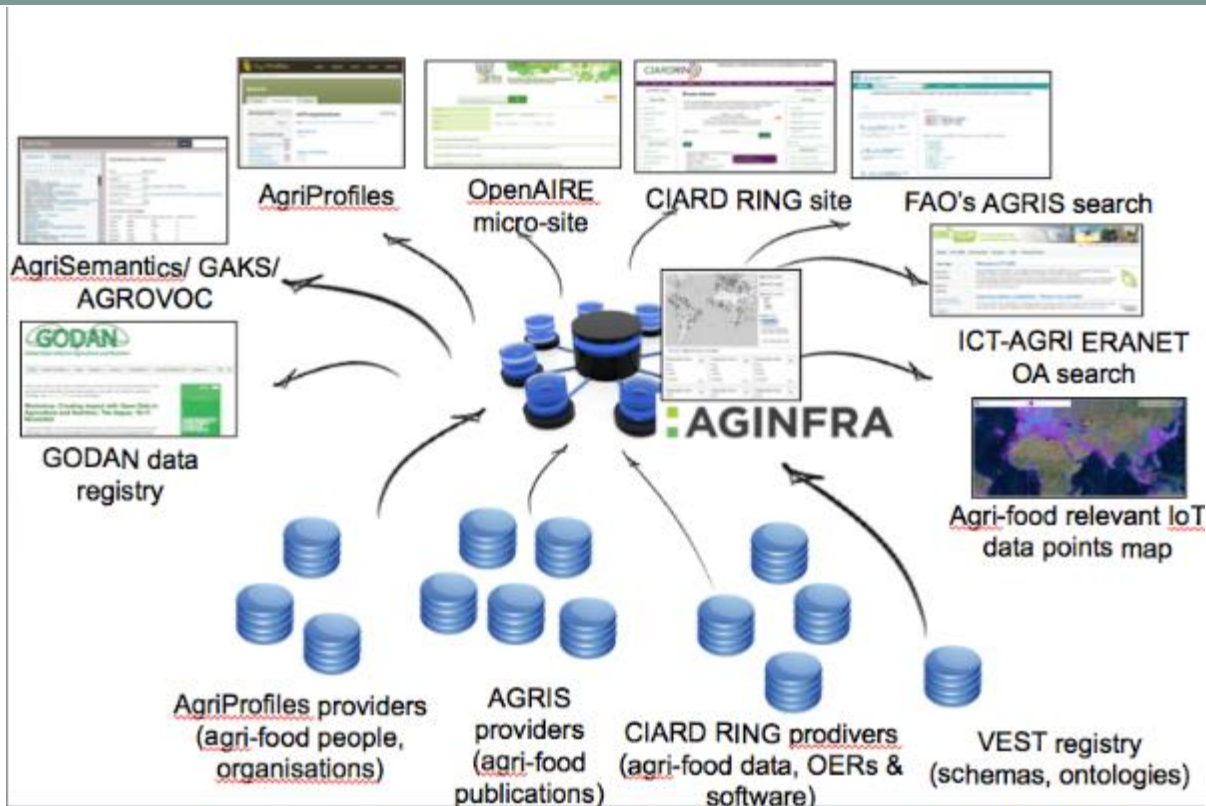
(GLN), Agricultural

Bibliography Network

(ABN), AgroVoc, AquaMaps,

Fishbase

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SC2: Food & Agriculture



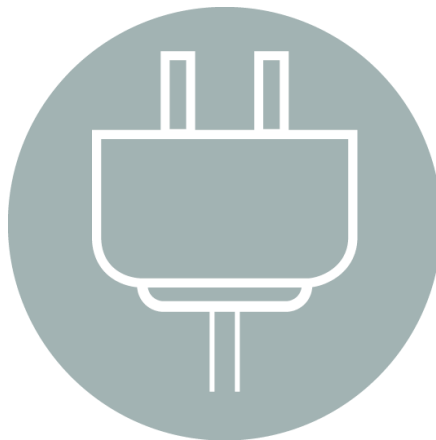
Pilot focus area: **Viticulture**

*(from the Latin word for vine)
is the science, production,
and study of grapes.
It deals with the series of
events that occur in the vineyard.*





SC3: Energy



SC3: Energy



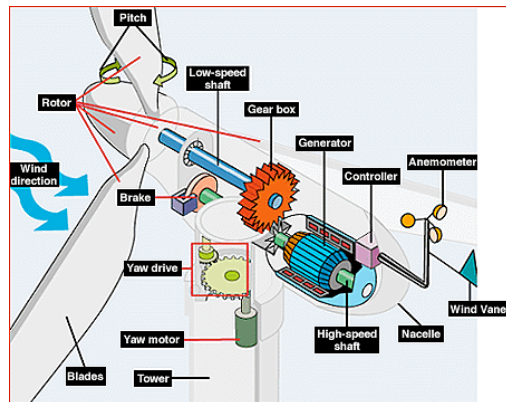
SC3: Energy

Big Data Focus area: Real-time turbine monitoring stream processing and analytics

Selected Key Data assets: European Energy Exchange Data, smart meter sensor data, gas/fuels market/price data, consumption statistics, stratigraphic model data (geology, geophysics)

Pilot focus area:

System monitoring in energy production units.



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SC4: Transport



The Fraunhofer Society is a German research organization with 67 institutes spread throughout Germany, each focusing on different fields of applied science.



The **Centre for Research and Technology-Hellas (CERTH)** founded in 2000 is one of the leading research centres in Greece. CERTH includes the **Hellenic Institute of Transport (HIT):** Land, Sea and Air Transportation as well as Sustainable Mobility services



ERTICO - ITS Europe is a partnership of around 100 companies and institutions involved in the production of Intelligent Transport Systems (ITS).

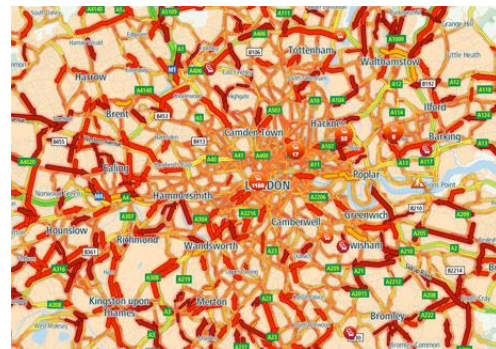


SC4 Pilot Focus Area

Info mobility based on *Mobility Pattern* Identification

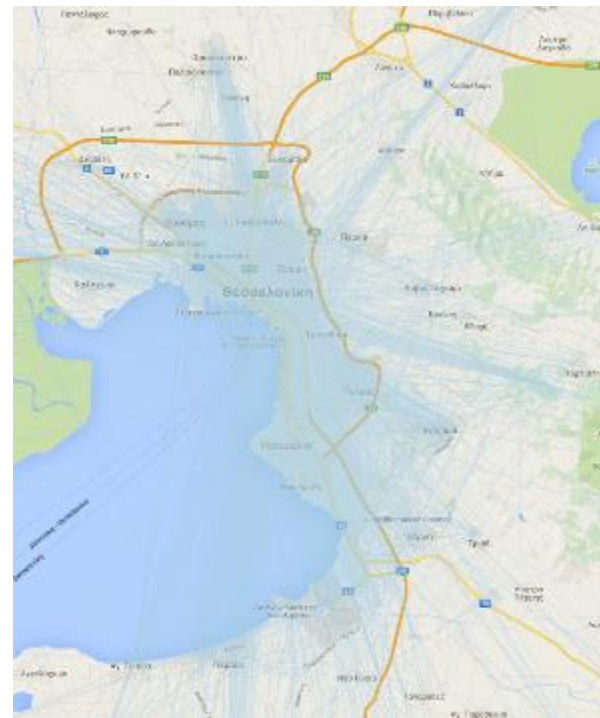
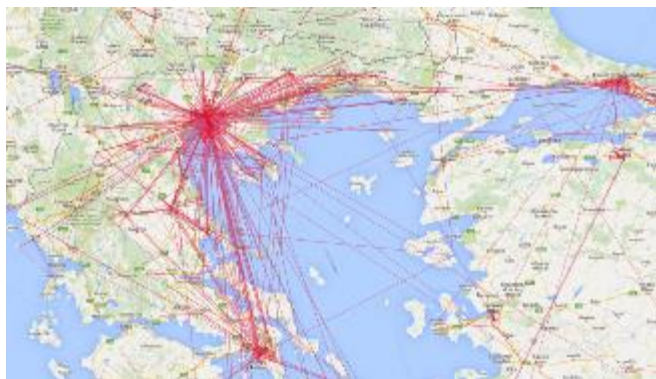
Pilot 4: Multisource data collection
for the provision of accurate info-
mobility and advanced transport
planning service in **Thessaloniki,**
Greece

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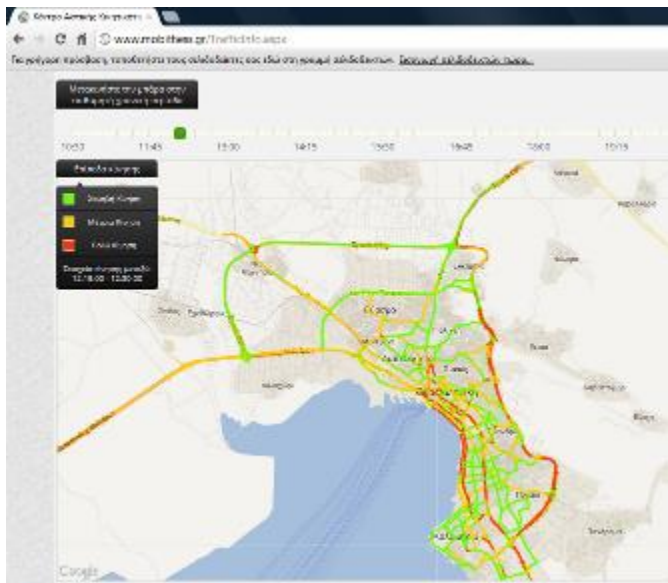
SC4: Twitter data in Thessaloniki



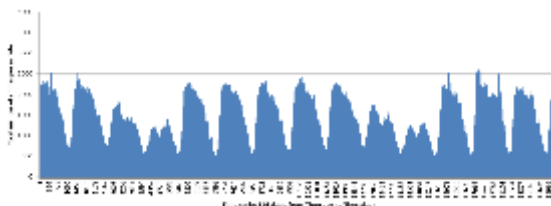


SC4: Floating Car Data

Real time traffic conditions information based on a combination of traffic modeling and real time measurements (traffic flow and speed)

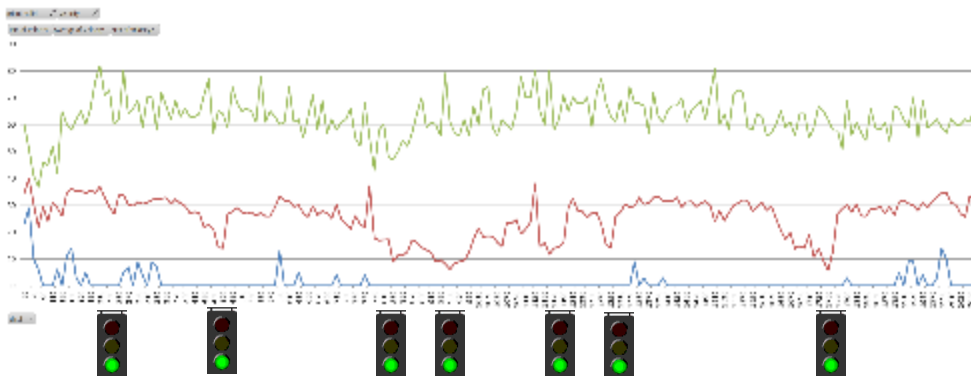


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>1.200 vehicles (one taxi fleet)

- Circulating 16-24 hours/day
- Pulse each 100m or 10s
- 500-2.500 pulses /minute



Speeds along a 2km stretch



SC5: Climate



SC5: Climate



SC5: Climate

Pilot focus area:

Supporting data-intensive climate research

Big Data Focus area: Enormous simulation time. Extremely complicated computing model.

Selected Key Data assets: European Grid Infrastructure (EGI). Access to several data centres hosted at CNRS-Lyon, NCSR-D Athens, INFN-Milan, NIKhEF-Amsterdam.



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SC6: Social Sciences



SC6: Social Sciences



SC6: Social Sciences

Pilot focus area: Citizens budget spending on municipal level

Big Data Focus area: Statistical and research data linking & integration
Selected Key Data assets: Federated social sciences data catalogs, statistical data from public data portals and statistical offices (e.g. EuroStats, UNESCO, WorldBank)



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SC7: Security



SC7: Security



SC7: Security

Pilot focus area: Getting insight in man-made surface changes triggered by automatic detection, news, or social media information

Big Data Focus area: Image data analysis

Selected Key Data assets: Earth Observation data (e.g. Very High Resolution Satellite Imagery acquired from commercial providers and governmental systems) and collateral data for supporting CFSP/CSDP missions and operations

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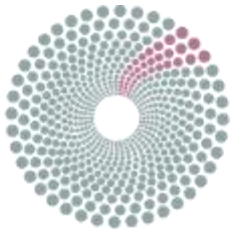


SC7: Security

Pilot 7: Ingestion of remote sensing images and social sensing data to detect and verify man-made changes on the Earth surface for security applications

Reasons:

- © **Evacuation** route planning
- © **Monitoring** of critical infrastructures
- © **Border security**
- © Satellite image data is HUGE and computational intensive to compare
- © Smart 'focus' algorithms are needed to prioritize the analysis jobs



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STAKEHOLDER COMMUNITY ACTIVITIES

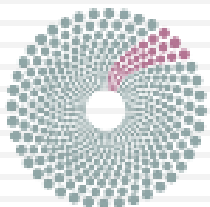


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2nd round of Societal Workshops

Health	19 October	Brussels	Standalone Workshop
Food&Agri	30 September 2016	Brussels	Collocated with DG AGRI WP2018-20 stakeholder consultation
Energy	20 September 2016	Brussels	Collocated with H2020 Energy InfoDay (19th)
Transport	16 September 2016	Brussels	Collocated with TM 2.0 Steering Body meeting
Climate	February 2017	Brussels	Collocated with EC JRC Ispra Workshop
Societies	5 December 2016	Cologne	Collocated with EDDI16- 8th Annual European DDI User Conference
Security	18 October 2016	Brussels	Standalone Workshop



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#BigDataEurope



Questions & Contacts



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