Big Data for Mobility Tracking Knowledge Extraction in Urban Areas (Track&Know)

Ibad Kureshi

Inlecom Systems, BE

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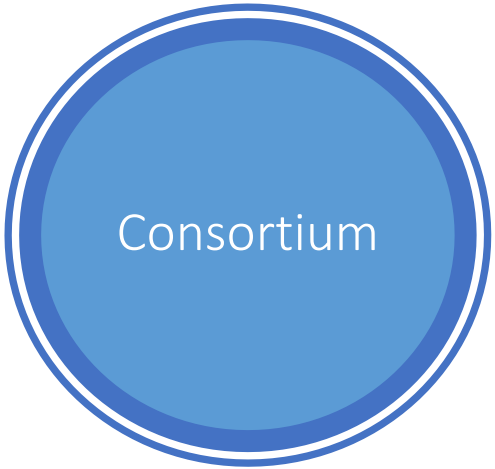
Track & Know

Consortium



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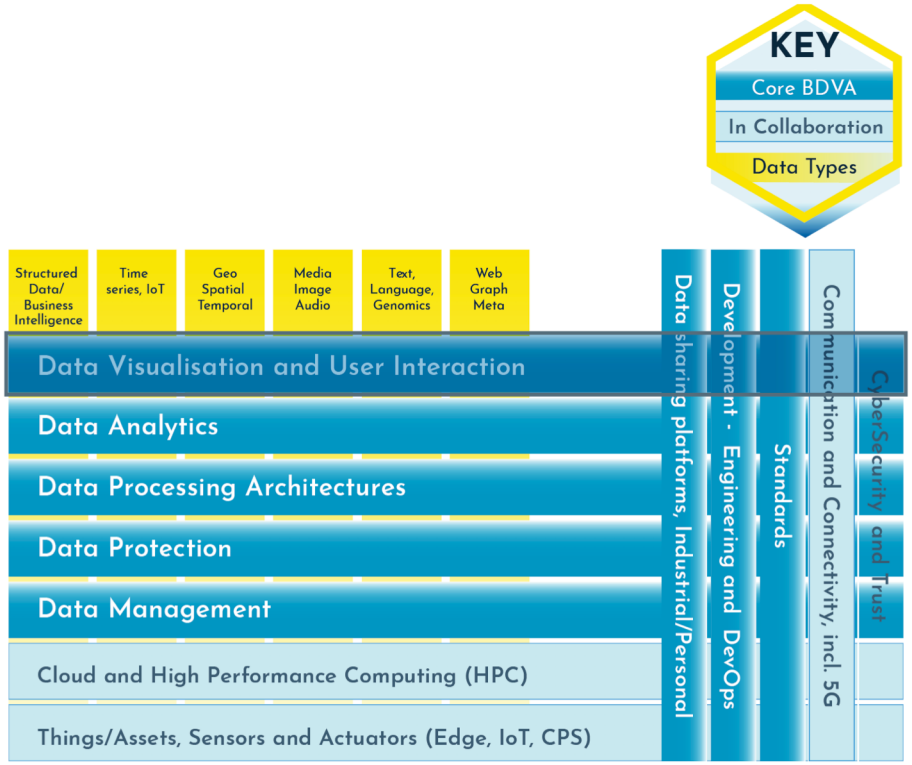
T&K Vision (1/2)

*Track&Know will research, develop and exploit a **new software framework** that aims at increasing the **efficiency of Big Data applications** in the transport, mobility, motor insurance and health sectors.*

*Stemming from industrial cases, Track&Know will develop **user friendly toolboxes** that will be readily applicable in the addressed markets.*

T&K vision is in accordance with …

- **the EU Big Data Value Reference model**



Source: European Big Data Value Strategic Research Innovation Agenda (SRIA), v.4.0, Oct. 2017. http://bdva.eu/sites/default/files/BDVA_SRIA_v4_Ed1.1.pdf

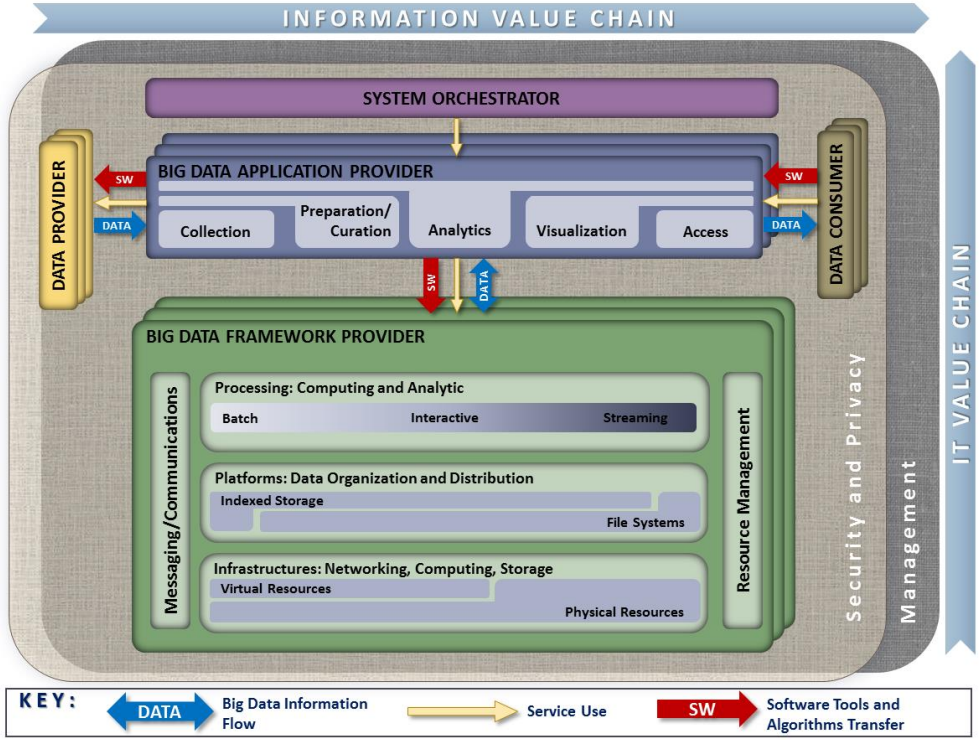
T&K Vision (2/2)

Track&Know will research, develop and exploit a ***new software framework*** *that aims at increasing the* ***efficiency of Big Data applications*** *in the transport, mobility, motor insurance and health sectors.*

Stemming from industrial cases, Track&Know will develop ***user friendly toolboxes*** *that will be readily applicable in the addressed markets.*

T&K vision is in accordance with …

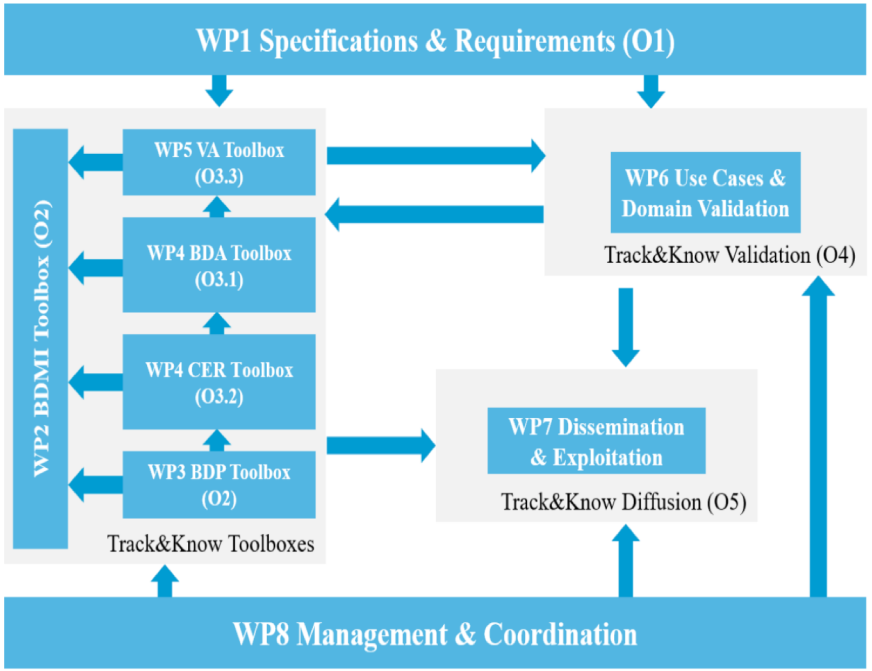
- the EU Big Data Value Reference model
- **the US Big Data Reference Architecture model**



Source: NIST Big Data Interoperability Framework: Volume 6, Reference Architecture, v.2, Jun. 2018. https://doi.org/10.6028/NIST.SP.1500-6r1

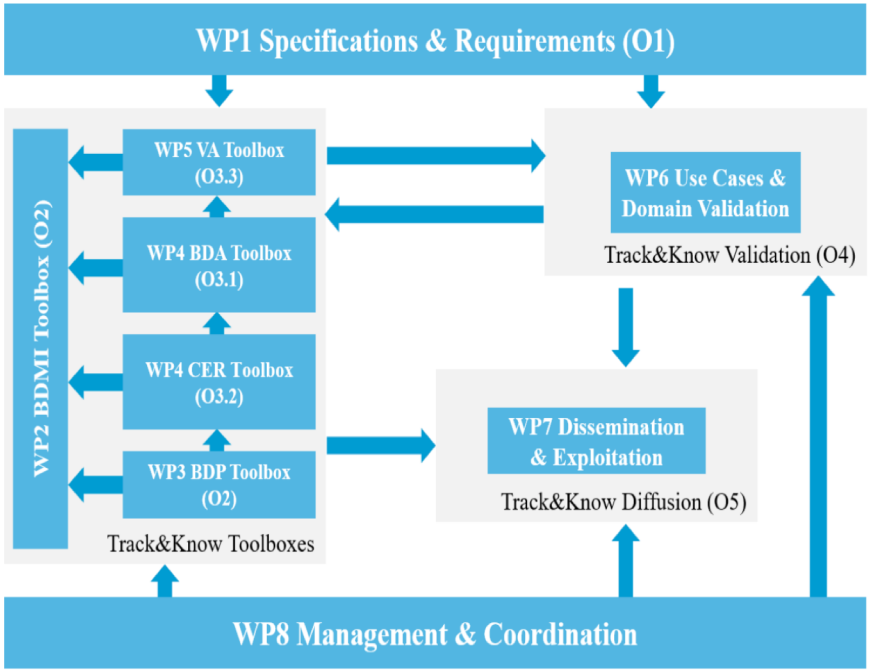
T&K Technical Objectives (1/2)

- **Objective O1:** *Create the T&K Framework …, mapping … to the **BDVA Reference Model**.*
- **Objective O2:** *Establish the T&K Data Processing Architectures Set comprising of the software stacks for the scalable and efficient ingestion and Management of Big Data from of voluminous and heterogeneous data sources such as asynchronous data streams, batch and interactive data sources. […**Big Data Processing (BDP) Toolbox** within the **Big Mobility Data Integrator (BMDI) Toolbox** …].*
  - *O2.1: Produce a scalable, fault-tolerant platform for Big data by collecting, integrating and processing streams of data*
  - *O2.2: Build efficient, interoperable and scalable Track & Know Toolboxes with Big Data software stacks and integrating them into the Big Mobility Data Integrator*
  - *O2.3: Produce toolsets for efficient distributed management, process mining querying and visualisation of Big Data (BDP Toolbox)*
- *(cont.)*



T&K Technical Objectives (2/2)

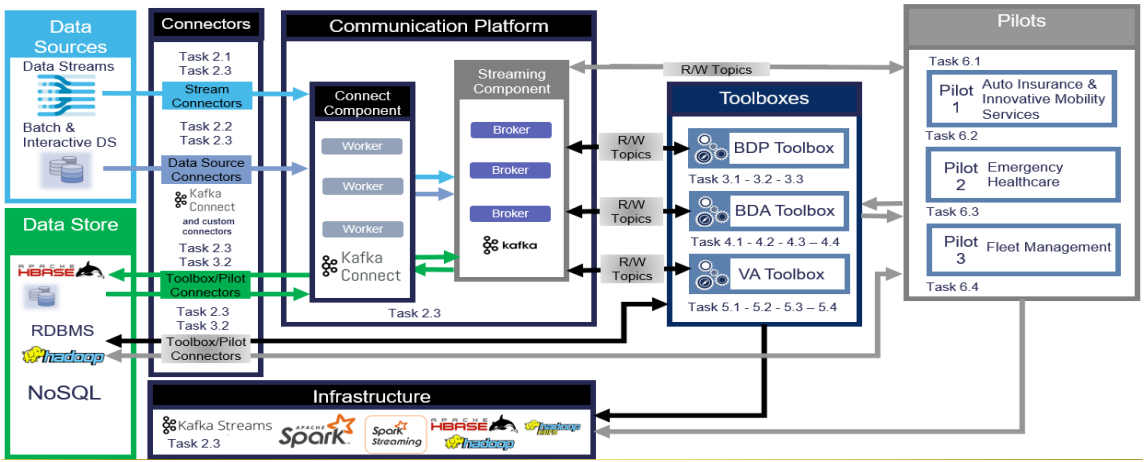
- *(cont.)*
- **Objective O3:** *Produce the Track&Know Analytics Toolboxes […* ***Big Mobility Data Analytics (BDA) Toolbox*** *and the* ***Predictive Complex Event Recognition (CER) Toolbox****.]*
  - *O3.1: Develop the Big Data Analytics (BDA) Toolbox over trajectories of Floating Car Data, exploiting integrated data-in-motion and data-at-rest for Data Analytics over automotive transportation from moving entities' trajectories*
  - *O3.2: Create the Predictive Complex Event Recognition (CER) Toolbox*
  - *O3.3: Produce Real-time Interactive Visual Analytics (VA) Toolbox to integrate interactive scalable VA methods that can handle efficiently both archival and streaming spatiotemporal data, with varying levels of resolution and quality*
- **Objective O4:** *Test, Validate and Evaluate the Track&Know Toolboxes addressing different industrial domains, …*



T&K Big Data Platform

- Platform Architecture

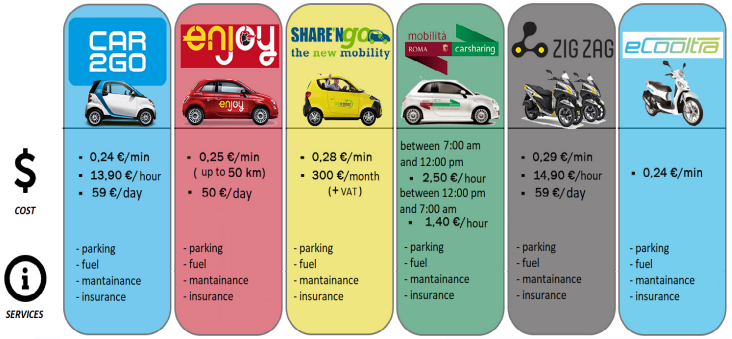
- Platform to **handle heterogeneous streaming and archival data** through the use of newly created toolboxes
- Software Toolboxes, i.e.
  - **data-intensive computing**
  - **interoperability**
  - **usability**
  - **standardisation**
- All data from streaming and archival data sources, as well as results from toolboxes can take full benefit of the computations of others, also taking advantage of seamless interoperability between their results.



Insurance Domain Pilot

Pilot 1 – Sistematica S.p.A

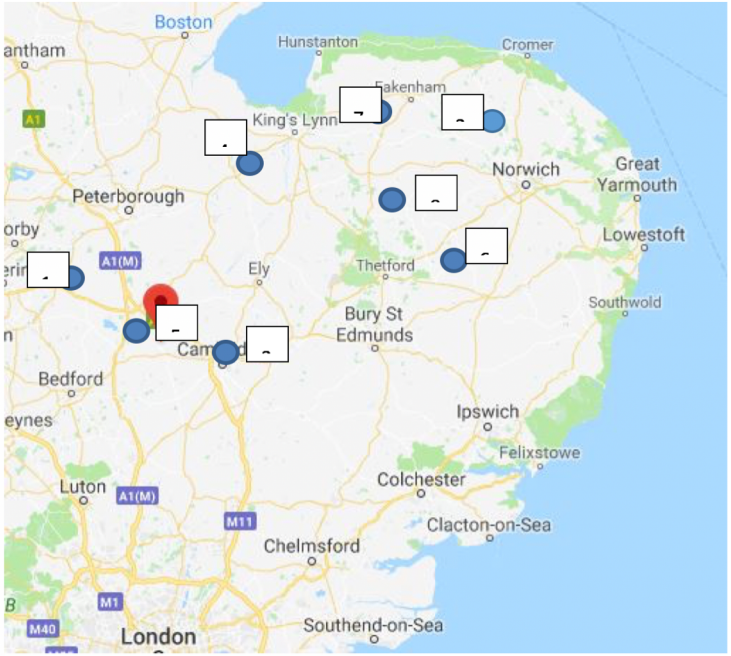
- GPS location data from vehicle black boxes (provided by Octo Telematics)
- Business cases:
  - Insurance: using historic telematics, environmental, demographi and geographic information, … gain in-depth and accurate crash probability estimation
  - Electric Cars: (i) cost-benefit of a switching to an electric car mobility; (ii) matching global charging times and charging points to drivers' habits
  - Car Pooling: (i) park decreasing due to sharable routes; (ii) cost-benefit of switching to a sharing mobility paradigm; (iii) likelihood of finding a proper sharable route that matches time and geographical zone
- Case studies: London (metropolitan city), Rome (metropolitan city), Tuscany, Italy (country-urban mixed area)



Medical Service Optimisation

Pilot 2 – Royal Papworth Hospital

- A complete set of 5 years data from Obstructive Sleep Apnoea (OSA) patients
- Business objectives:
  - Improvement of response times (increasing new patients, follow-up patients)
  - Reduction of unnecessary travel (reduce patient travel distances, courier costs, CO2 emissions
  - Cost efficiency gains
- Datasets are geographically situated in London area and Cambridge, UK

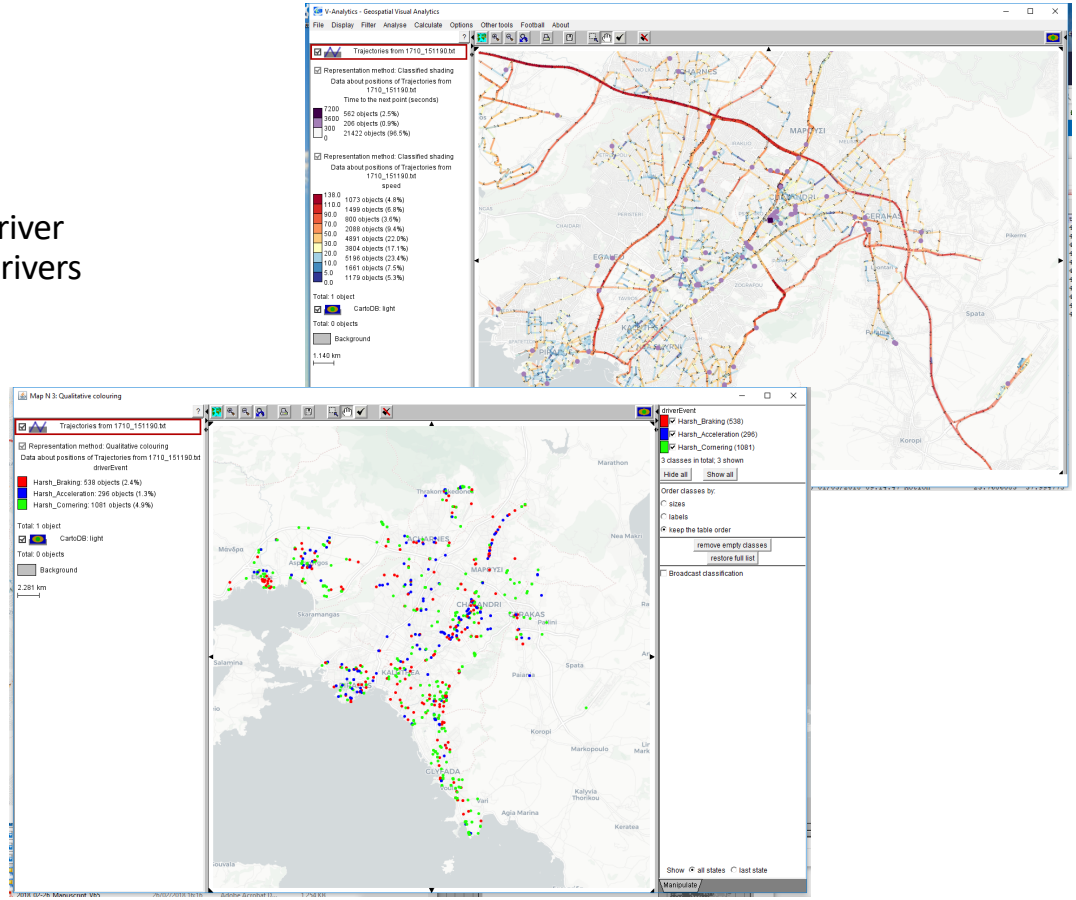


Network of Outreach Clinics staffed by PAP

Fleet Management Domain

Pilot 3 – Vodaphone Innovus

- GPS and other sensor data (incl. fuel level and driver behavior data) from vehicles (tracks) and their drivers
- Business objectives:
  - Predictive maintenance
  - Anomaly detection, reduction of false alarms
  - Correlation of Fleet Data with external Weather and Traffic services
  - Fleet costs reduction
  - Fleet downtime reduction
  - Fleet response time improvement
  - Improve driver behavior and reduce accidents
- Datasets are geographically situated in Greece, Albania, Cyprus and few in various EU countries



Images produced by FRHF (Apr. 2018)

Outcomes 2 Policy

- Each of the Pilots will have direct effects on Public Policy
- Stakeholder workshops include planning and commissioning groups from the public sector
- Car Pooling and EV migration recommendations
- New more inclusive Medical outreach policies
- Driver training and allocation policies

Current Status

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Thank You

Dr Ibad Kureshi

ibad.kureshi@inlecomsystems.com

Inlecom BVBA, BE