Business Innovation in the Development of Big Data Toolboxes for the Management of Professional Vehicle Fleets

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Track & Know

Fleet Management and Digital Transformation

- Modern fleet management systems go beyond of simple location tracking.
- Fleet operators require a more in depth knowledge of the current fleet status
- Historical data need to be analyzed in order to assess past fleet operation
- Accurate predictions are needed for better future fleet utilization
- Tools should be able to give answers to varius fleet management business cases.

The role of Big Data in Fleet Management and in the Supply Chain

- Fleet Management systems rely on continuous real time monitoring of vehicles updates
- A fleet of 10k vehicles generates more than 250M records per month
- Online and offline data processing offers:
  - Detailed status of each vehicle
  - Possible future position
  - Better utilization of the fleet which leads to reduced cost and quality if supply chains

Business opportunities

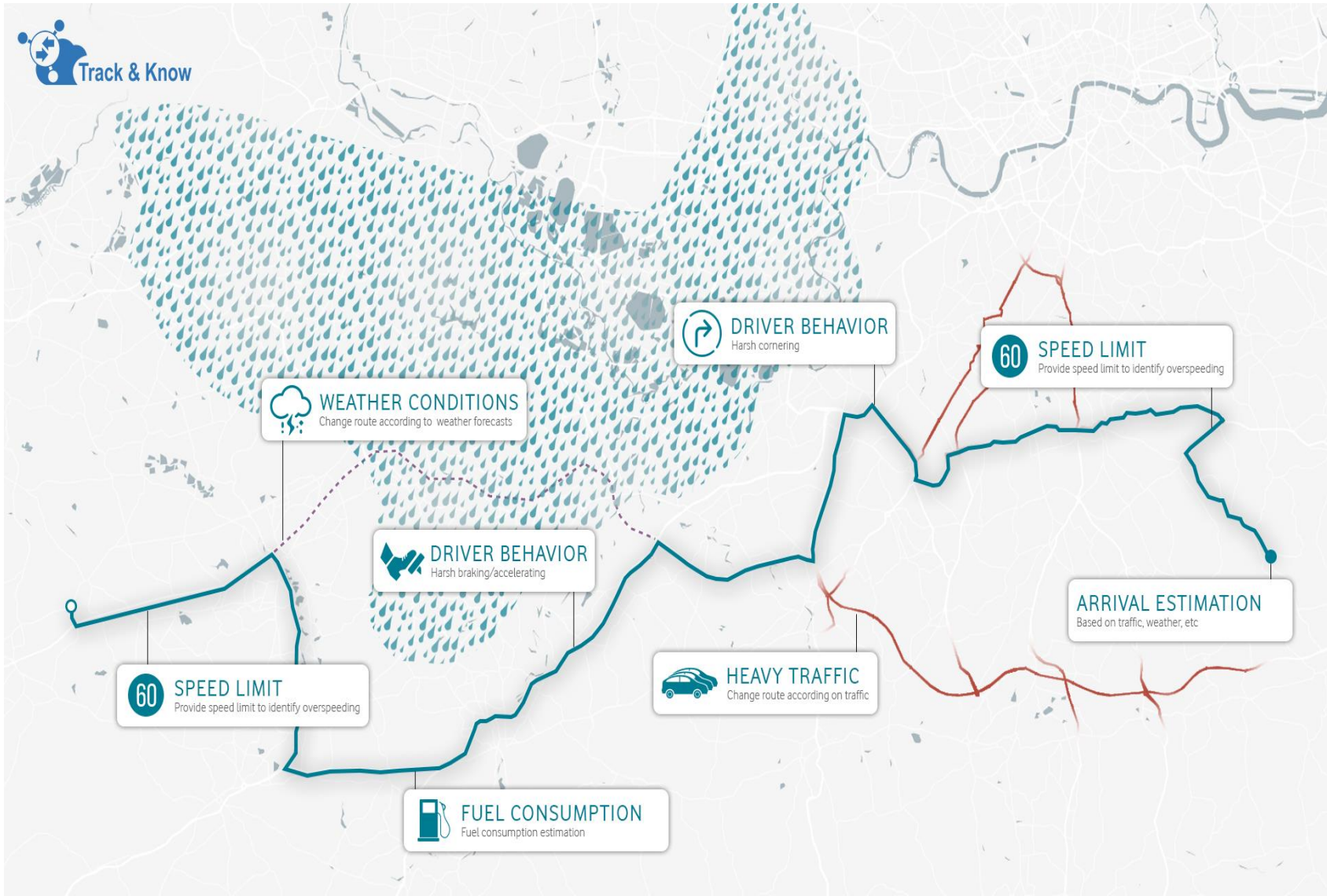
- Clean data to minimize erroneous sensor readings
- Insights due to correlations with the operational environment of the vehicles (e.g. weather, traffic etc.),
- Advanced management of large amounts of data on demand,
- Provide fleet managers with robust solutions for: driver behaviour; fuel efficiency; and, predictive maintenance.

Leading the user for actions

- Fleet operators don’t always have time to make a good decision

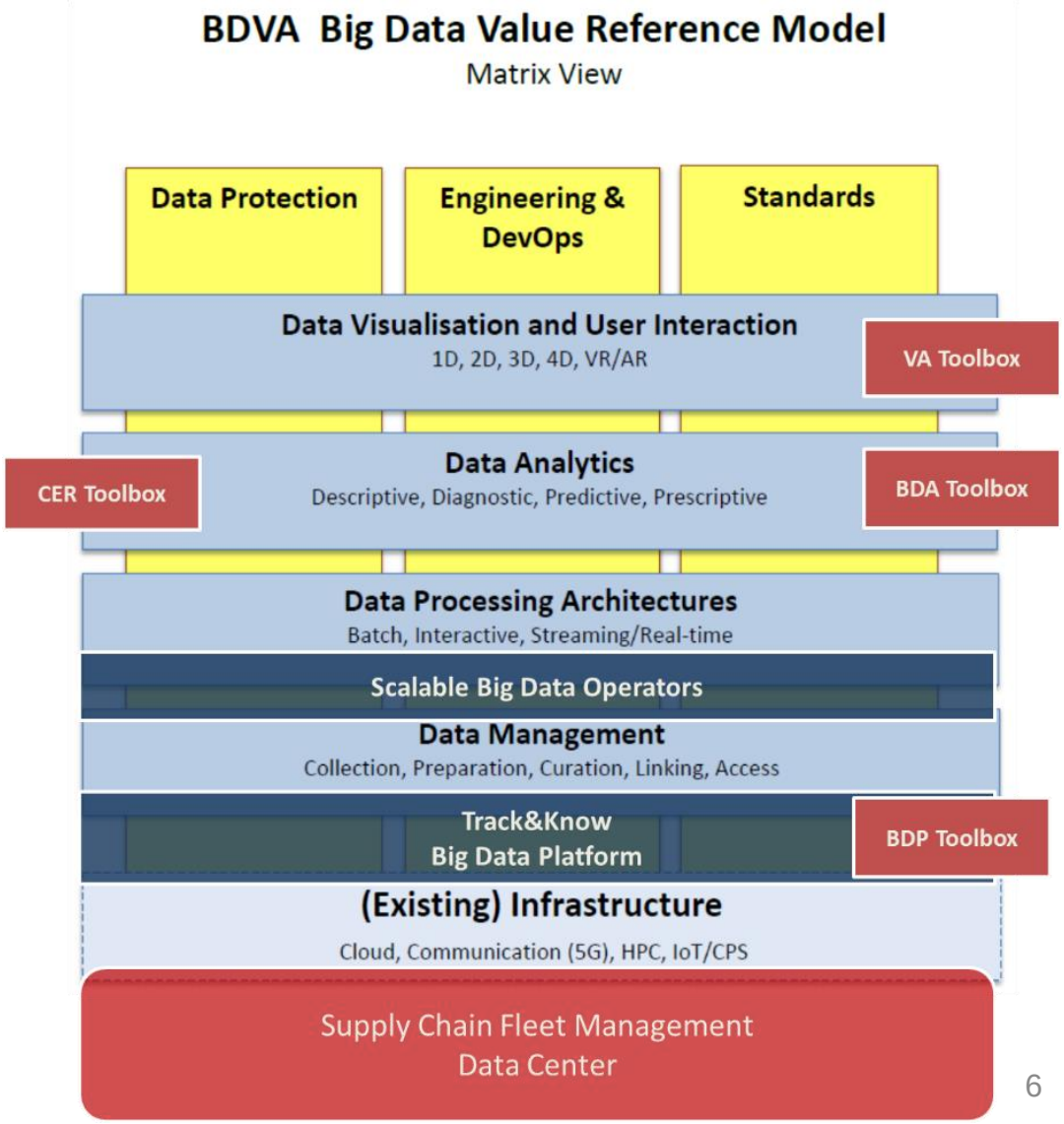
But

- A single picture can be enough to guide a user for action



Track & Know Big Data Toolboxes

- Big Data Processing (BDP)
- Big Data Analytics (BDA)
- Complex Event Recognition (CER)
- Visual Analytics (VA)



Big Data Processing (BDP)

- The BDP Toolbox specifically considers the needs of researchers, scientists, practitioners, and developers that work with big mobility data.
- It supports
  - Scalable storage and indexing
  - Efficient query processing.

Big Data Analytics (BDA)

- Cluster analysis
- Find and identify hot spots is specific area and time
- Find patterns “hidden” inside the data; where current business cases are unaware off
- Match raw or resampled GPS trajectories to the underlying road network
- Prediction of the future location of trajectories

Track & Know Capabilities	Related Fleet Management Business Requirements
BDP: Reliable data collection modes	- Increase the number of external sources integrated in by the Big Data Platform (e.g. weather, holidays and geographic points identification, etc.)
BDP: Track&Know Big Data Operators	- Reduce invalid coordinates introduced due to errors in the fleet monitoring system - Reduce cases of invalid speed calculations due to errors in the fleet monitoring system
BDA: Support for computing intensive, analytic processing, and machine learning techniques	- Identify driving behavior excess per driver - Provide recommendations for fuel consumption reduction based on driver behavior - Identify patterns leading to improved fleet maintenance costs - Support preventive maintenance recommendations based on tracked parameters (service downtime, tire life, etc.)
BDA: Future Location Prediction	- Proactive identification of traffic hot spots per day - Alternative routes per identified hot spot
BDA: Trajectory Prediction	- Provide recommendations for fuel consumption reduction based on the overall fleet performance optimization - Provide accurate estimations of future travel distances - Increase the recommendations for alternative routes based on fuel economy and road conditions

Thank You

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