Big data in the vehicle: another brick in the wall?

Intelligent transportation in the era of big data
PTOLEMUS is the first strategy consulting firm focused on telematics and geolocation

### Our consulting services

<table>
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<th>Strategy definition</th>
<th>Vision creation, strategic positioning, business plan development, board coaching &amp; support</th>
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<tr>
<td>Investment assistance</td>
<td>Strategic due diligence, market assessment, feasibility study, M&amp;A, post-acquisition plan</td>
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<td>Procurement strategy</td>
<td>Specification of requirements &amp; tender documents, launch of tenders, supplier negotiation &amp; selection</td>
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<td>Innovation management</td>
<td>Value proposition definition, product &amp; services development, architecture design, assistance to launch</td>
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<td>Business development</td>
<td>Partnership strategies, detection of opportunities, ecosystem-building, response to tenders</td>
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<td>Implementation</td>
<td>Deployment plans, complex / high risk project &amp; program management, risk analysis &amp; mitigation strategy</td>
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### Our fields of expertise

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<th>Car infotainment &amp; navigation</th>
<th>Connected services (Traffic information, fuel prices, speed cameras, weather, parking, points of interest, social networking), driver monitoring, maps, navigation, smartphone integration</th>
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<td>Usage-based charging</td>
<td>PAYD / PHYD insurance, road charging / electronic tolling, fleet leasing &amp; rental, car sharing, Car As A Service, etc.</td>
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<td>Telematics &amp; Intelligent Transport Systems</td>
<td>ADAS, connected vehicle, crowd-sourcing, fleet management, eCall, bCall, SVR, tracking, vehicle data analytics (OBD / CAN-bus), VRM, V2X, xFCD</td>
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<td>Positioning / Location enablement</td>
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<td>M2M &amp; connectivity</td>
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We help all players in the mobility ecosystem
The ETC Global Study is the most comprehensive analysis of the tolling market worldwide

- 500 pages of analyses of the global electronic tolling market based on:
  - 60 interviews in 12 countries
  - 135 figures and charts
  - 3 years of hands-on experience
  - Our experience advising key players in the ecosystem

- A systematic review of each ETC network in Europe, the US and 20 other countries
  - Detailed profile per country
  - The range and evolution of core technologies analysed
  - The new patents and partnerships
  - Regulatory changes (EETS, etc.)

- Tolling models, enforcement and technologies compared & analysed
  - Business models of GNSS vs. DSRC based on case studies
  - Evolution paths between toll gates, ETC and MLFF
  - The rise of mobile tolling

- 14 case studies including AutoPass, BroBizz, Ecotaxe, LKW Maut, Hu-Go, e-way, ViaPassVia Verde, The Hub, PrePass

- 2014-30 market forecasts
  - Country forecasts for Canada, China, France, Germany, India, Italy, Japan, Russia, South Africa, the UK & the US
  - Bottom-up estimates of the number of devices sold, vehicles subscribed by technology & vehicle type

- Toll service providers and service provider market models
  - Markets’ readiness for interoperability
  - Integration of tolling with 11 VAS and 5 connectivity services

- A complete set of recommendations for governments, toll chargers, toll service providers, technology suppliers and telematics service providers

Note: A free abstract will be made available in the coming weeks on www.ptolemus.com/tolling
Vehicles host fresh, sensitive, high value data, which also creates new service provision opportunities.
Numerous stakeholders are starting to offer connected vehicle services...

Connectivity is fostering competition
... Leading to *numerous* connected devices in the vehicle

- Digital tachograph
- eCall device
- Insurance telematics device
- Electronic tolling device
- On-board computer
- Smartphone
- Fleet telematics black box
...and numerous ETC technologies* used globally

Source: ATI, PTOLEMUS ETC Global Study 2015 - Note: * For toll calculation
Numerous standards are relevant to Electronic Fee Collection but they are not all applied.

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Drivers directly feel the walls between different providers
Saving lives

Scenario 1

Major car accident in rural area

**Today**
- Car can remain unassisted for hours
- Risk of death or aggravation of injuries is very high
- Rescue depends on good samaritans...

**With connectivity - ACN / eCall by OEM**
- Alert is sent immediately indicating the magnitude & location of the crash and a call is made to check status
- An ambulance is sent within 1 minute
- Rescue time is generally < 30 minutes depending on area

**With Big Data**
- Alert is sent immediately to emergency centre, road authority, family and insurance company
- The ambulance is made aware of the particular condition and blood group of the driver
- The road operator can organise the cleaning of the road surface & limit side accidents and traffic jams
- The insurer can initiate the claims & indemnification process, without any request to the family at this difficult time

Source: PTOLEMUS - Note: ACN: Automatic Crash Notification
Big data in the vehicle - Benefits

Saving money

Scenario 2

Car gearbox about to break down

Today

- Driver continues driving until vehicle stops
- Risk of related accident is high
- Breakdown can happen anywhere... preferably in the worst place...

With connectivity - Remote diagnostics by OEM

- Driver receives alert on her mobile phone after her last trip
- It is requested to drive asap to its dealer
- The gear box is replaced at a cost of €5000 within 3 days

With Big Data

- Driver receives alert on her mobile phone after her last trip from her car maker & her roadside assistance company
- She receives two quotes and chooses the workshop recommended by her assistance company, as it has the gearbox in stock
- The gearbox is replaced within 24 hours at a cost of €3500

Source: PTOLEMUS
Saving time, money and the environment

**Scenario 3**

*HGV traveling between different countries / states*

**Today**

- Driver stops at all toll gates
- Driver loses precious time in traffic jams at toll gate
- Toll tickets are expensed, generating significant

**With connectivity - ETC by each service provider**

- Driver equips his truck with a specific device for each toll charger
- Authorisation & payment are made automatically, saving significant time on the road and in the office
- Company must handle accounts with each toll charger & devices storage & installation logistics
- Potentially dozens of devices on the windscreen...

**With Big Data**

- Driver equips his truck with a single connected device
- Itinerary is optimised based on complete cost including energy & tolling
- Pays for all roads & motorways automatically thanks to a single invoice from its service provider
- Device is also used for the tachograph service, roadside assistance, fleet management, eCall and UBI
Let us analyse 5 of these connected services

- Usage-based Insurance
- Road charging
- Car sharing
- bCall
- Car diagnostics & maintenance
Numerous of these functions could be mutualised, notably when related to device, data, connectivity & billing.
Integration of multiple services is coming...

Specific functions*
- Underwriting
- Bank guarantee
- Transaction management
- Assistance
- Diagnostics analysis

Claims management
Fraud management
Moderation
Contractor management
Repair network

Functions that can be mutualised
- 24/7 operations
- Connectivity
- Data management
- Customer support
- Billing
- Accounting
- Authorisation
- Authentication
- Positioning

* Non exhaustive list

Source: PTOLEMUS
To achieve big data, walls between different services must be broken.
Obviously big data service providers must take privacy more than seriously.

Abiding by the law

Make privacy policy transparent

Make privacy policy understood

Give control of the data back to the user

Create a privacy-enabled system from the start

PRIVACY AND USER COMFORT
All service providers are starting to aggregate & integrate connected services but not all are as powerful.
Regulatory initiatives may be required to trigger the opening of the European e-tolling market

Possible evolution scenario

- A number of factors are driving change
  - **2009 decision on EETS directive** makes EETS available for HGVs from October 2012 and for other passenger cars and LCVs by October 2014
  - **2011 Eurovignette directive** on HGV road charging enables toll charging for external costs & dynamic / congestion-based charging on all motorways
  - **EU "20-20-20" climate objective** involving a 20% reduction in CO₂ emissions by 2020 (vs. 1990)

- The Belgian project (2016) and the renewal of the German system in 2017 could be the 1st steps of a EU-wide interoperability

- The Commission also announced in March 2013 the Regional EETS (REETS) project gathering 8 countries

- We expect however that the EC will need to pass further legislation to force Member States & toll chargers to open up the market

Source: PTOLEMUS ETC Global Study 2015
To achieve big data, let us break the walls between technologies, stakeholders & industries

- The path towards tolling interoperability is long & uncertain
- Other industries are moving much faster towards connected vehicle services, driven by car makers, leasing companies and Internet players such as Google
- **Tolling operators** should drive interoperability & integration with other services if they do not want to become payment commodities
- **Regulators** should **create level playing fields to competition** by opening access to data to all parties
  - A Minimum Set of Data…
  - … at a reasonable cost
  - And public service data (accidents, road & weather conditions, etc.)

Thank you!