Véhicules connectés : les tendances techniques et normatives pour la création de services

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Identity & Key figures

A **family-owned, intermediated-sized** & **independent** company

Listed on the stock exchange Euronext Paris Compartiment B

Founded in

1986

Consolidated turnover 2017 :

436.1 M€

13 to 15%

of turnover

invested in R&D each year

More than **3,500** employees

throughout the world

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An international group

24 locations in *implantations dans* **16** different countries *pays*

FRANCE
GERMANY
SPAIN
ITALY
POLAND
CZECK REPUBLIC
UNITED KINGDOM
BELGIUM
SWEDEN
CHINA
JAPAN
INDIA
TUNISIA
UNITED STATES
BRASIL
MEXICO

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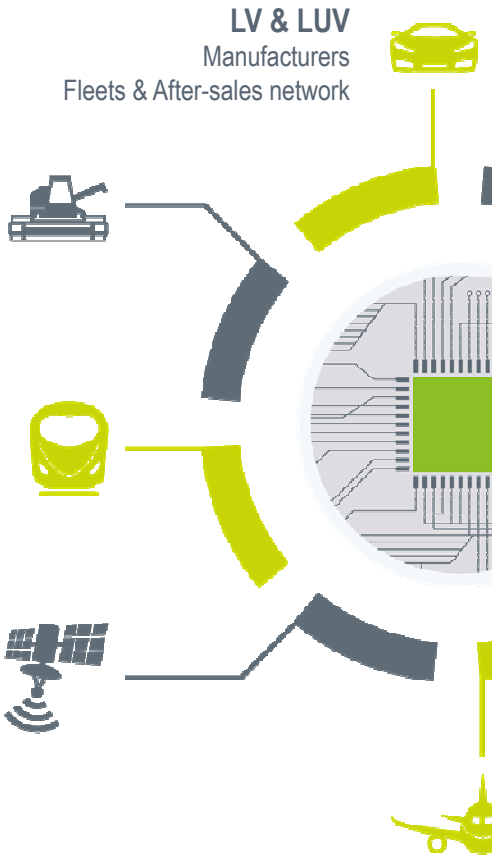
Our markets



LV & LUV
Manufacturers
Fleets & After-sales network

OFF-HIGHWAY
Agriculture
Construction
Marine

RAILWAY
Manufacturers & operators
Infrastructure & Trackside
Safety

TELECOMMUNICATION NETWORKS
SatCom
Network infrastructure

BUS & COACH
Manufacturers
Transport operators
& integrators

TRUCKS
Manufacturers
Fleets & After-sales networks

ENERGY
Smartgrid
Storage

AERONAUTICS, SPACE & DEFENCE
SatCom
On-board aerospace systems
Defence equipment

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Our concerns

MOBILITY
Transportation is at the heart of ACTIA's technological challenges. We are committed to producing connected, sustainable and safe mobility.

CONNECTIVITY
An expert in the domain of on-board systems designed for demanding environments, ACTIA provides connectivity for all sorts of vehicles, thus allowing access to many connected services.

ENVIRONMENT
ACTIA is committed to developing sustainable mobility - antipollution systems, electric and eco-driving – and favours « green » behaviours: carpooling, using electric vehicles…

SAFETY & SECURITY
Both inside and outside the company, safety & security requirements are present in our procedures, our quality standards and our products.

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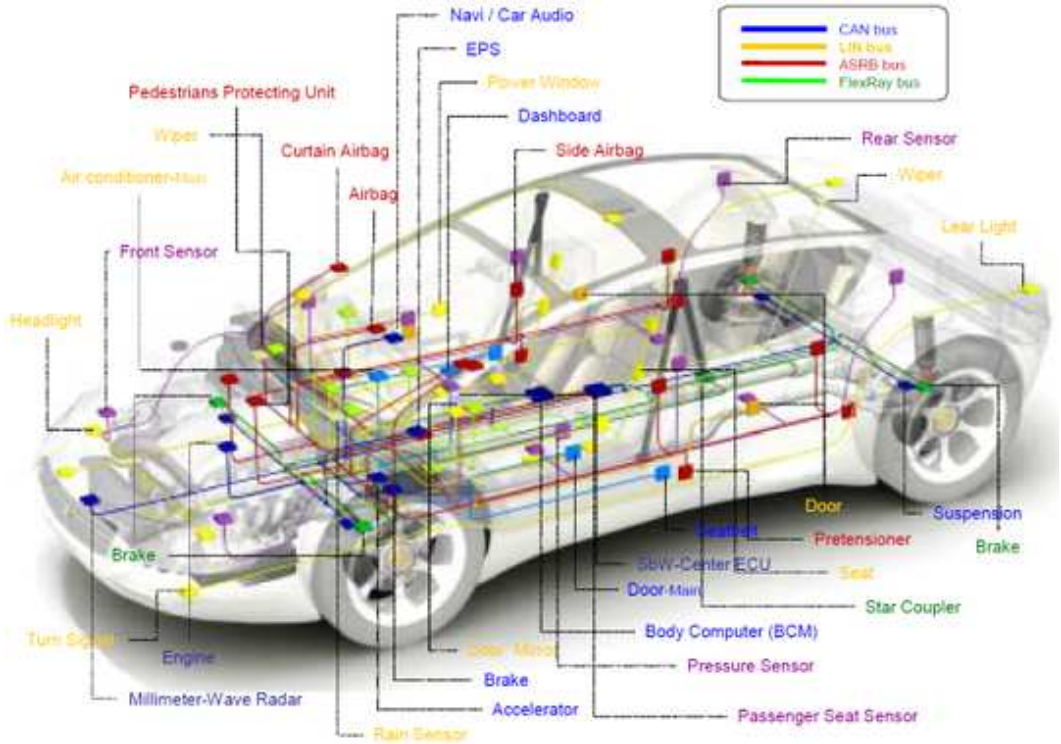
Vehicle Architecture

Up to 80 ECU connected through Buses



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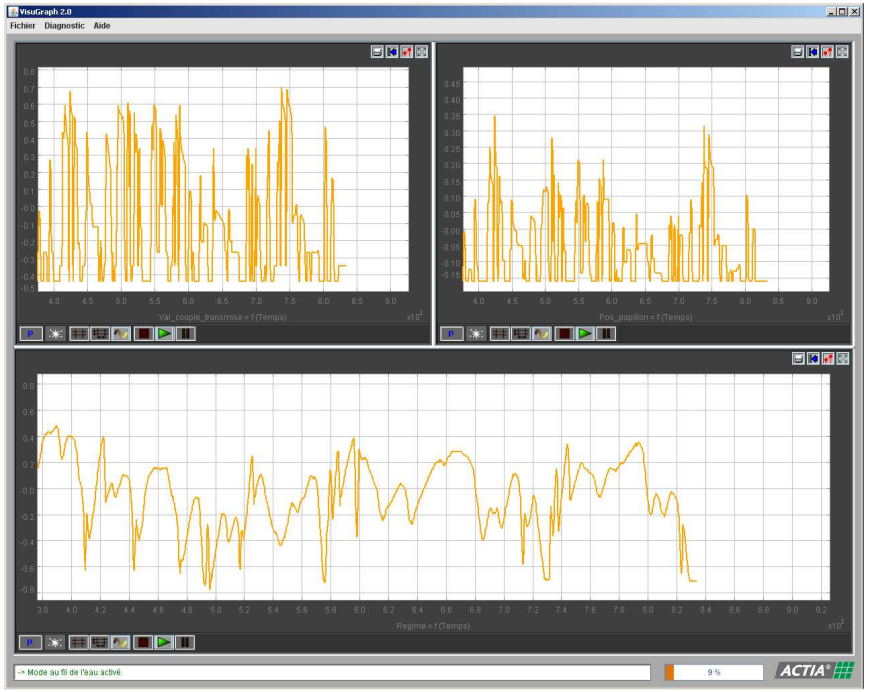
Available parameters

Several hundreds of parameters are available via sensors or computed values

- About the vehicle itself
  - Fuel consumption
  - Air admittance temperature
  - Air admittance pressure
  - temperatures
  - Wheel speeds
  - Steering wheel angle
  - Etc.

- About the vehicle environment
  - External temperature
  - Rain sensor
  - Road grip



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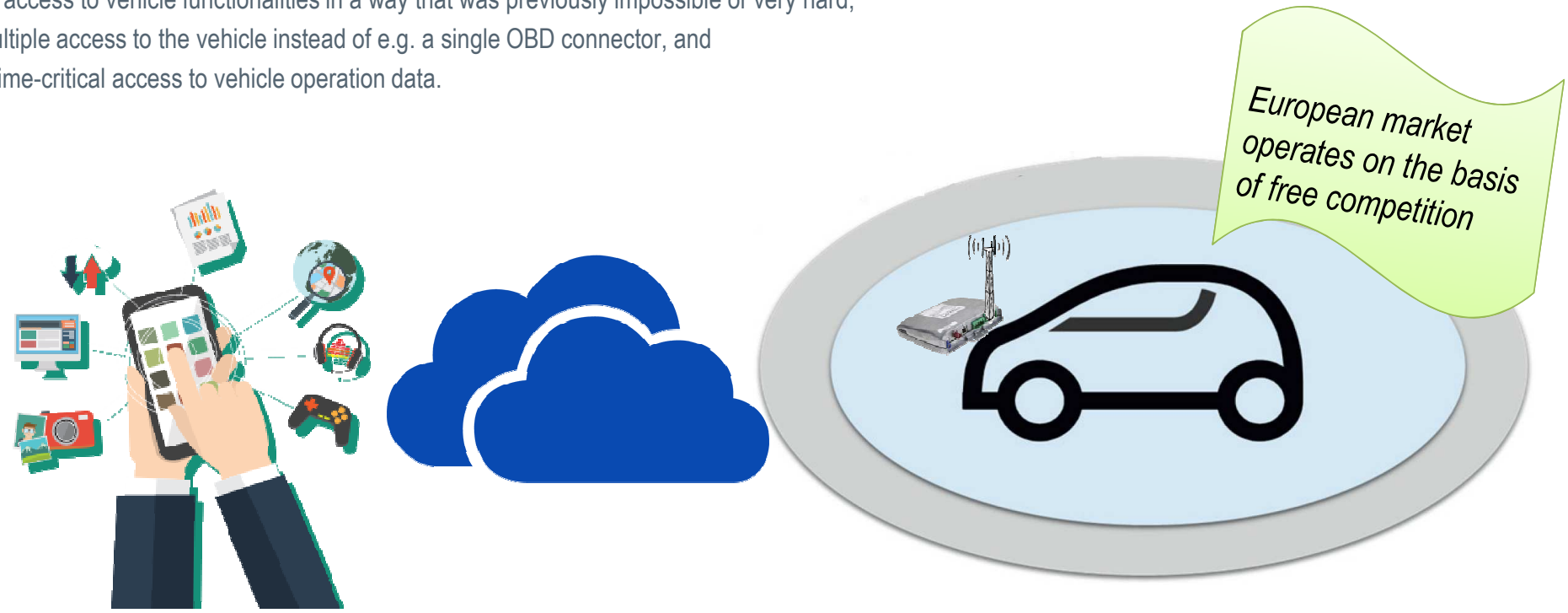
Extended Vehicle

New paradigm

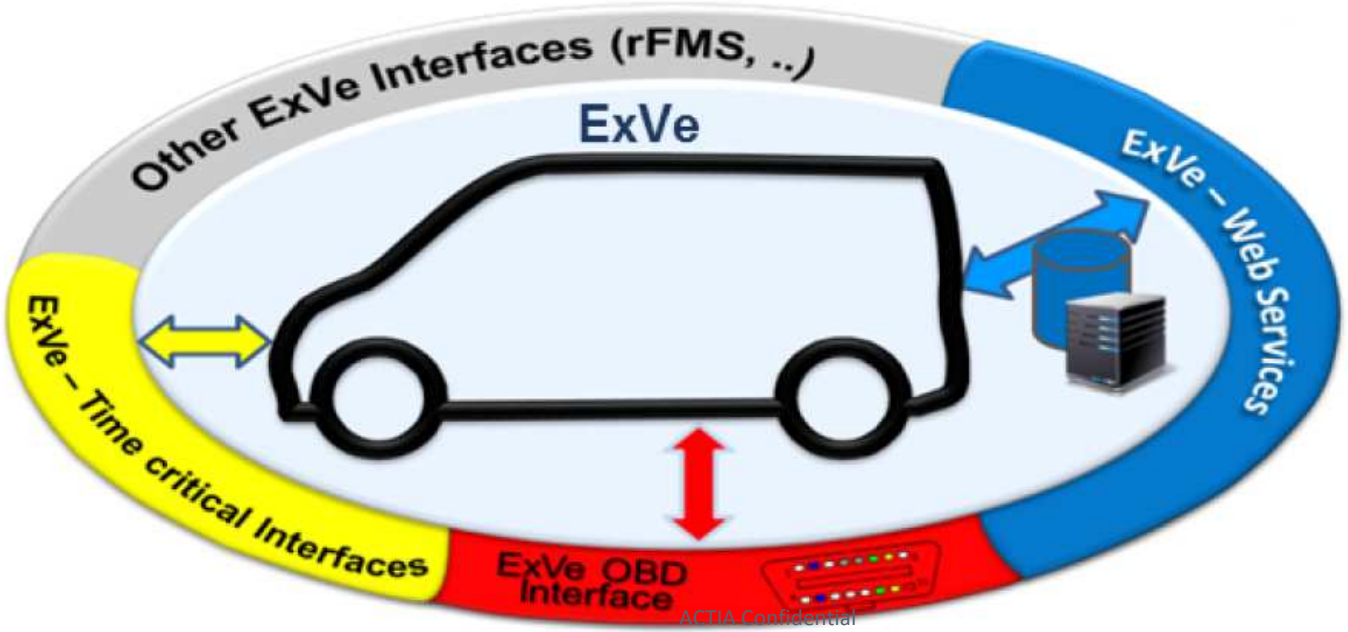
- The removal of the constraints linked with a physical connection has enabled the possibility of new services based on
  - an access to vehicle functionalities in a way that was previously impossible or very hard,
  - multiple access to the vehicle instead of e.g. a single OBD connector, and
  - a time-critical access to vehicle operation data.



Extended Vehicle

Concept

- An extended vehicle refers to all the technical components which enable a vehicle function, including the on-board and off-board data and systems required to perform this function.
- Thereby, the extended vehicle also includes all the interfaces permitting to access its data from the outside.
  - **Web services (ISO 20078 project)**
  - **Wireless time critical communication (V2V communication).**
  - OBD connector for retrieving OBD-related information by means of a wired connection
  - all other interfaces to the extended vehicle that may or may not be standardized.



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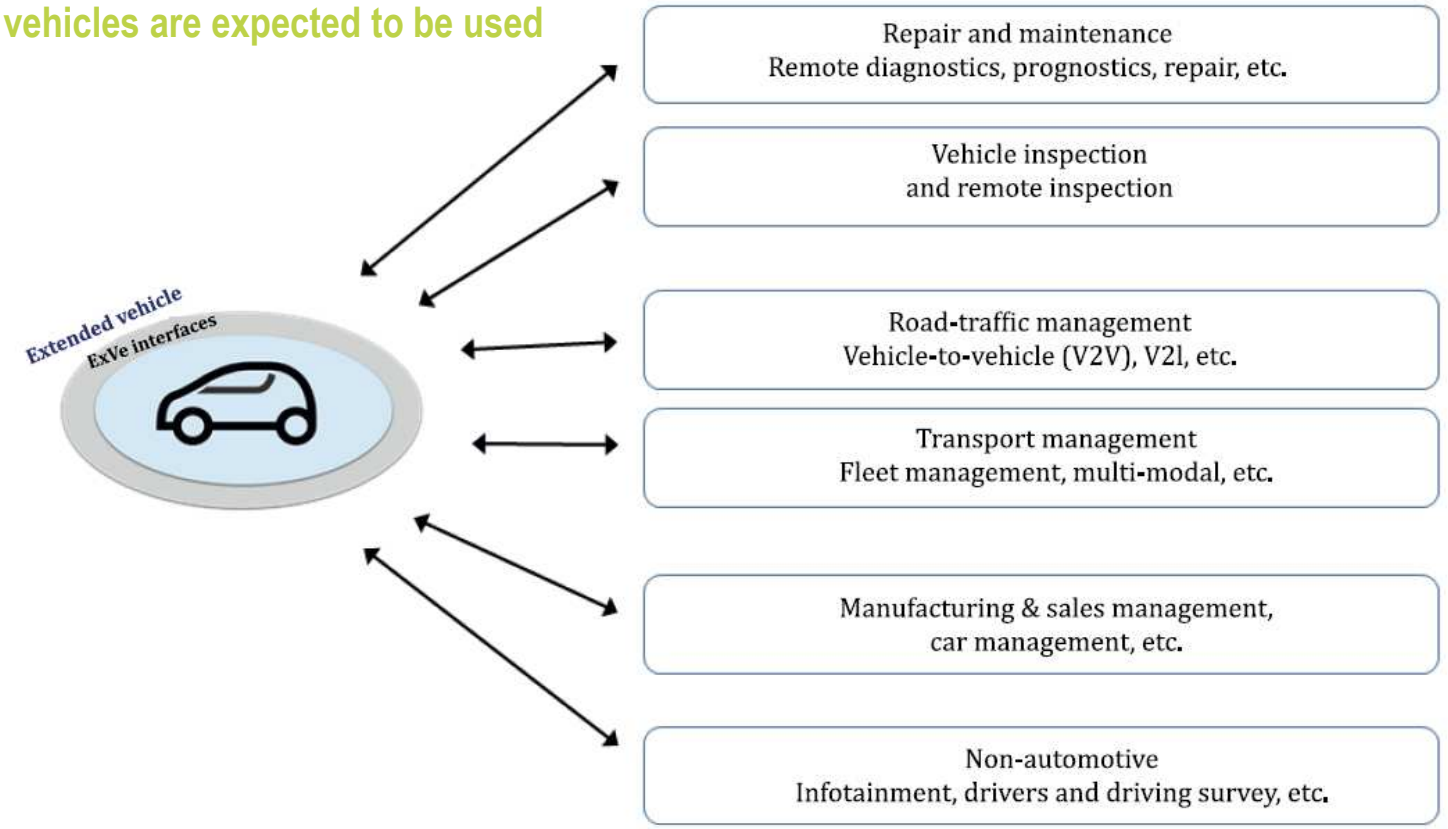
Extended Vehicle

Areas where the extended vehicles are expected to be used



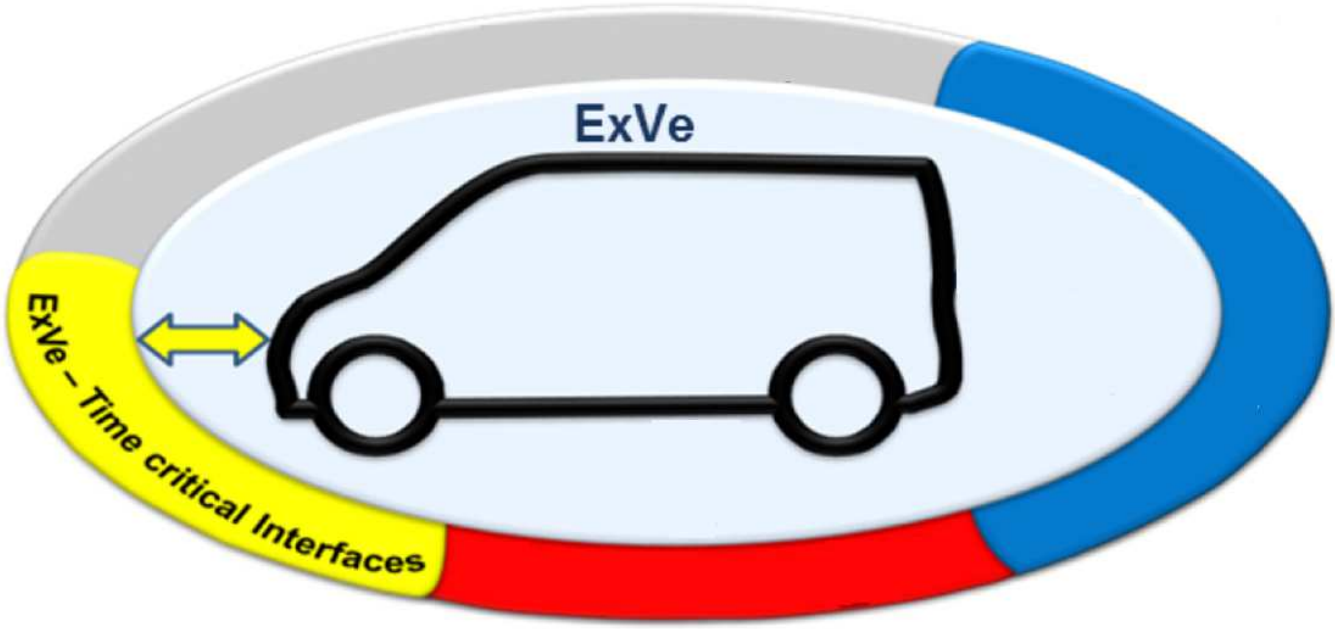
Design constraint

- Remote access shall not jeopardize the basic safety of persons and the security of the vehicle during all its life. It is the responsibility of the vehicle manufacturer to take additional specific security measures when designing an extended vehicle
- Whatever the country where the vehicle is intended to be marketed, the design of the extended vehicle shall respect laws and regulations

Extended Vehicle V2V

Time critical Interface V2V

- V2V : Vehicle to Vehicle
- V2I/I2V : Vehicle to Infrastructure
- V2X : Vehicle to X



V2X Standard européen : dates clefs

- Adoption en 2008 par la commission européenne d'un plan de déploiement pour les systèmes de transport intelligents puis d'une bande de fréquences harmonisée dans toute l'UE dédiée aux applications de sécurité dans les transports

- Mise en place par la Commission Européenne en Novembre 2014 de la Cooperative Inteligent Transport System platform

- Lancement en 2016 du projet européen C-ROADS pour affiner les spécifications du C-ITS, et réaliser des expérimentations

- Présentation en 2016 du rapport rédigé par suite aux travaux de la CITS platform

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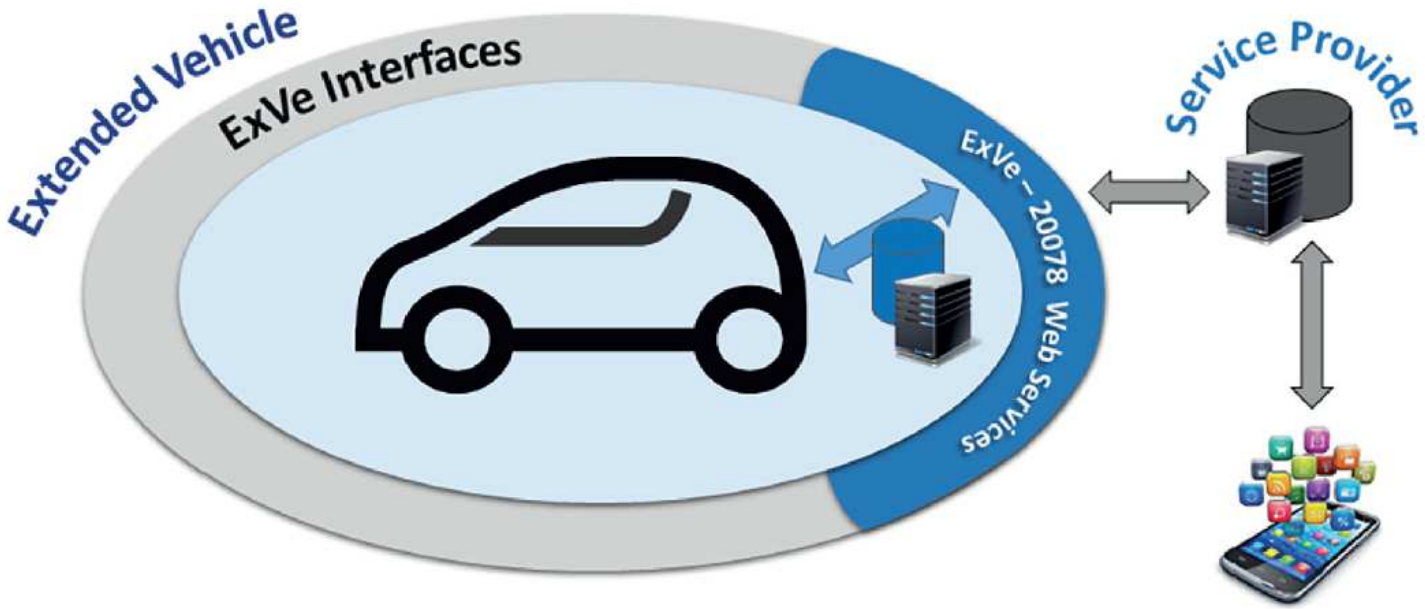
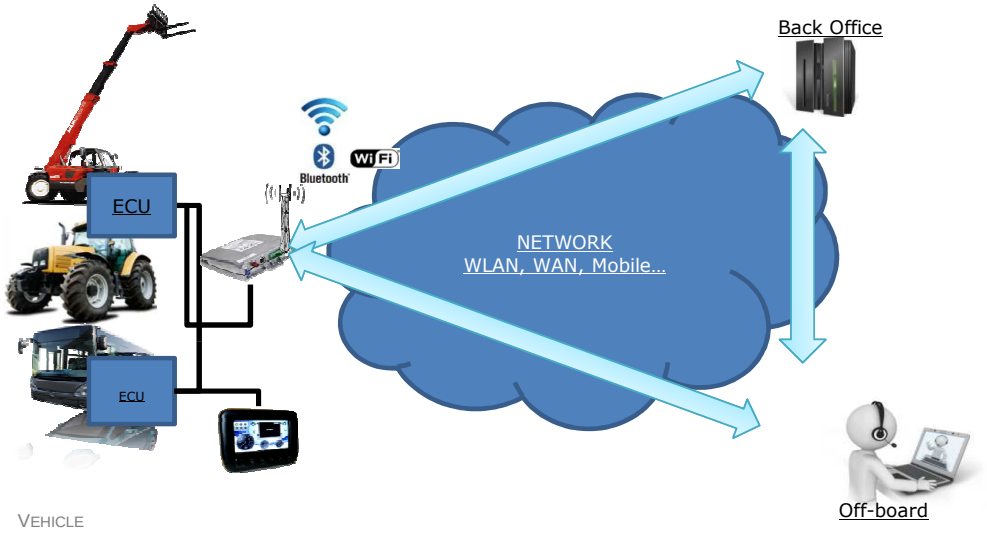
Extended Vehicle Web-Services

Web Services

- Web services are part of the typical interfaces of an extended vehicle. This corresponds to the software system designed by the manufacturer in order to support an interoperable machine-to-machine interaction between one of the servers that are part of the extended vehicle and other servers that are managed by service providers, who are external to the extended vehicle and through which a third party may communicate.
- This permits, for example, a diagnostic operator to diagnose the vehicle, in a remote manner, thanks to the services of a service operator adhering to the server-to-server interaction principles retained by the vehicle manufacturer for the relevant use case



Use case : Remote diagnostic



- Connected vehicle can be diagnose remotely by an operator:
  - Flash Over The Air of the ECUs
  - Onboard diagnosis DTC available
  - Safety/Security has to be taken into account

Use case: fleet

- As the **connected car develops**, the increased amount of **data generated** offers new opportunities for diagnosis, prognosis or environment monitoring.

- For instance, in 2012, BMW had around one million connected cars on the road, **generating** over **one million data requests** daily, in **2017**, it had 8.5 million connected cars generating over **85 million daily data requests**, equivalent to 850MB of data every day.

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Use case: Environment monitoring

- Traffic monitoring through position/speed of the vehicles
- Patch of ice detection and localization through wheel speed and steering wheel angle
- Mobile weather station for forecasting through rainfall/temperature sensor
- Potholes detection / road surface quality monitoring

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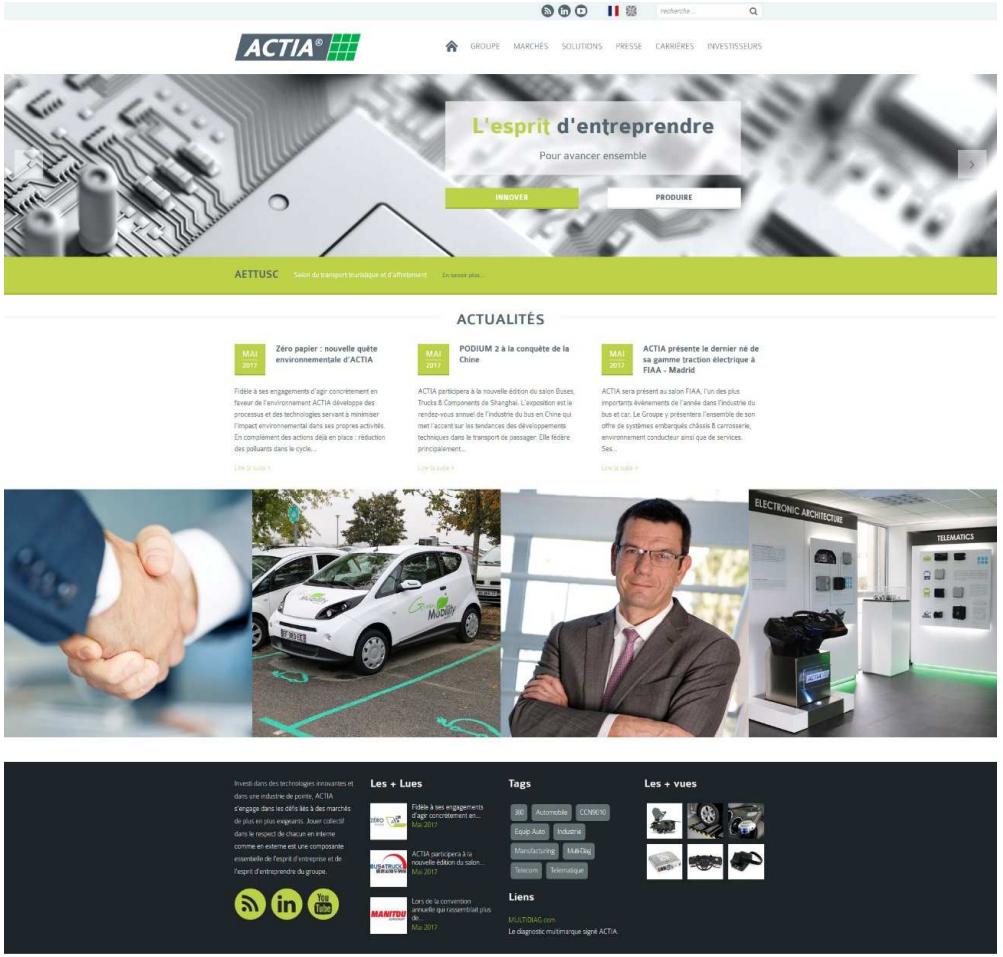

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