

AVL List GmbH (Headquarters)



IoT in Automotive Domain

Opportunities and Challenges

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Automotive domain in Europe

➤ Production figures

- 91.5 million motor vehicles produced worldwide
- **18.4 million of passenger cars** produced in Europe

➤ Economy figures (Europe)

- **Jobs: 12.2 million people** – 5.6% of EU employed population
- Added value: 139.4 billion € – 10.4 % of manufacturing sector
- Revenues for government (VAT, fuels, sales and registrations taxes): 401.5 billion €

➤ European automotive sector in the world

- 6.2 million vehicles exported by EU
- **Trade balance: 100.4 billion €**



Source:

<https://nocloudinthesky.wordpress.com/2013/01/25/alan-turing-car-production-and-machines/>

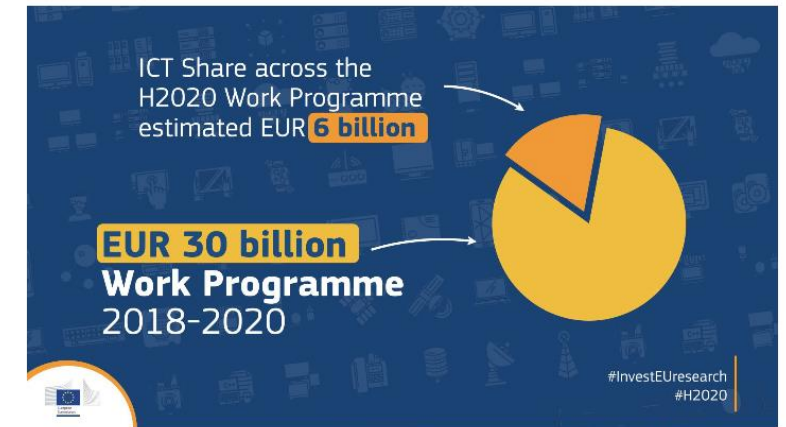
The automotive industry – Pocket guide 2016-2017, Editor: European Automobile Manufacturers Association, available at <http://www.acea.be/publications/archives/category/acea-pocket-guide>

Digital Single Market – a political priority from the European Commission



- **Digitalization** (“Digital Single Market” – DSM) identified as **one of its 10 political priorities** from the European Commission [2]
- Opportunity for digitalization: **accelerate innovation** by
 - Mapping different development stages within the product lifecycle
 - Bridging different application domains
- to finally improve the **competitiveness over the entire supply chain**
- Opportunity and challenge for industrial companies: enhance existing portfolio by **shifting value creation toward digitalization**

The last phase of Horizon 2020, the EU's Research and Innovation programme, has been launched. Roughly EUR 6 billion out of the overall budget of EUR 30 billion will be spent on research and innovations in the ICT sector.



[1] <https://ec.europa.eu/digital-single-market/en/news/european-commission-invest-eur-6-billion-digital-research-2018-2020>

[2] <https://ec.europa.eu/digital-single-market/en/policies/shaping-digital-single-market>

Opportunity for Digitalization

Societal challenges & market expectation

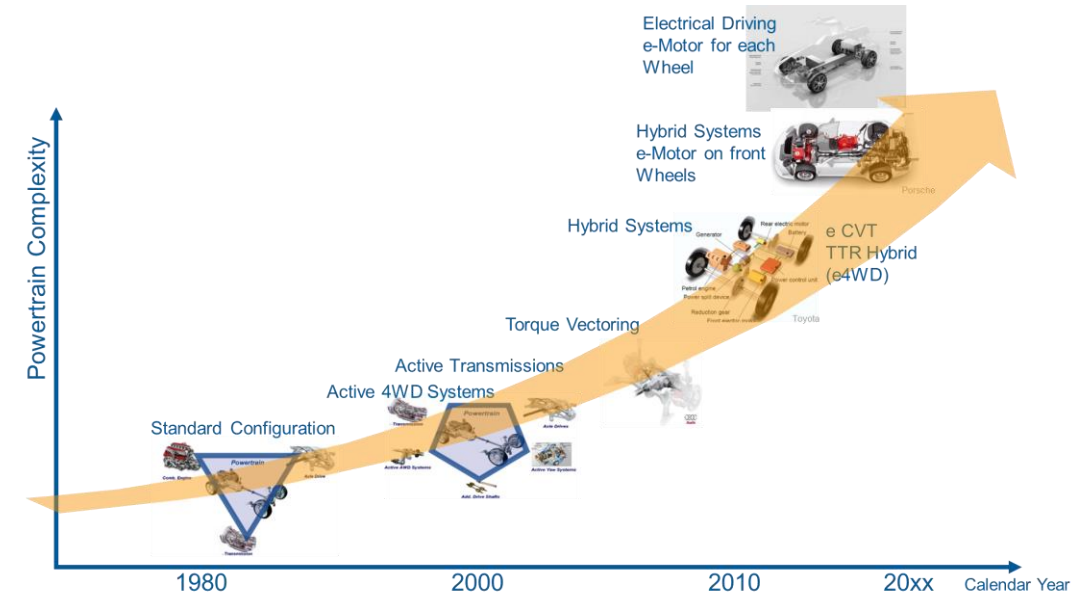
- **EC's targets** and directives related to **clean transportation** and reduction of pollutant emissions, **zero fatalities, mobility for ageing population**
- **Customer expectations** in terms of customization, product costs, system quality and overall dependability

Major automotive trends supported by technology push

- **ICT as strong driver for value creation** (advanced control strategies, connected vehicle, autonomous driving): leading to **exponential increase of system complexity**
- **Electrification**: increase of number of possible powertrain variants and resulting complexity
- Industry4.0 as **digitalization over the entire lifecycle**

Opportunities for use of digitalization in the automotive domain

- **Value creation for the end-users** by more intelligent / cognitive / adaptive products
- **Improving development / validation / production efficiency** by more intelligent / cognitive / adaptive development and production environments



The Automotive (Re)evolution

AVI



AVL Fields of Research

- Digitalization, data science
- Smart Production, I 4.0
- Virtual = Real
- Electrification
- Intelligent Mobility
- Autonomus driving, AI
- ...

Intelligent Mobility
Connected World
Shared Economy

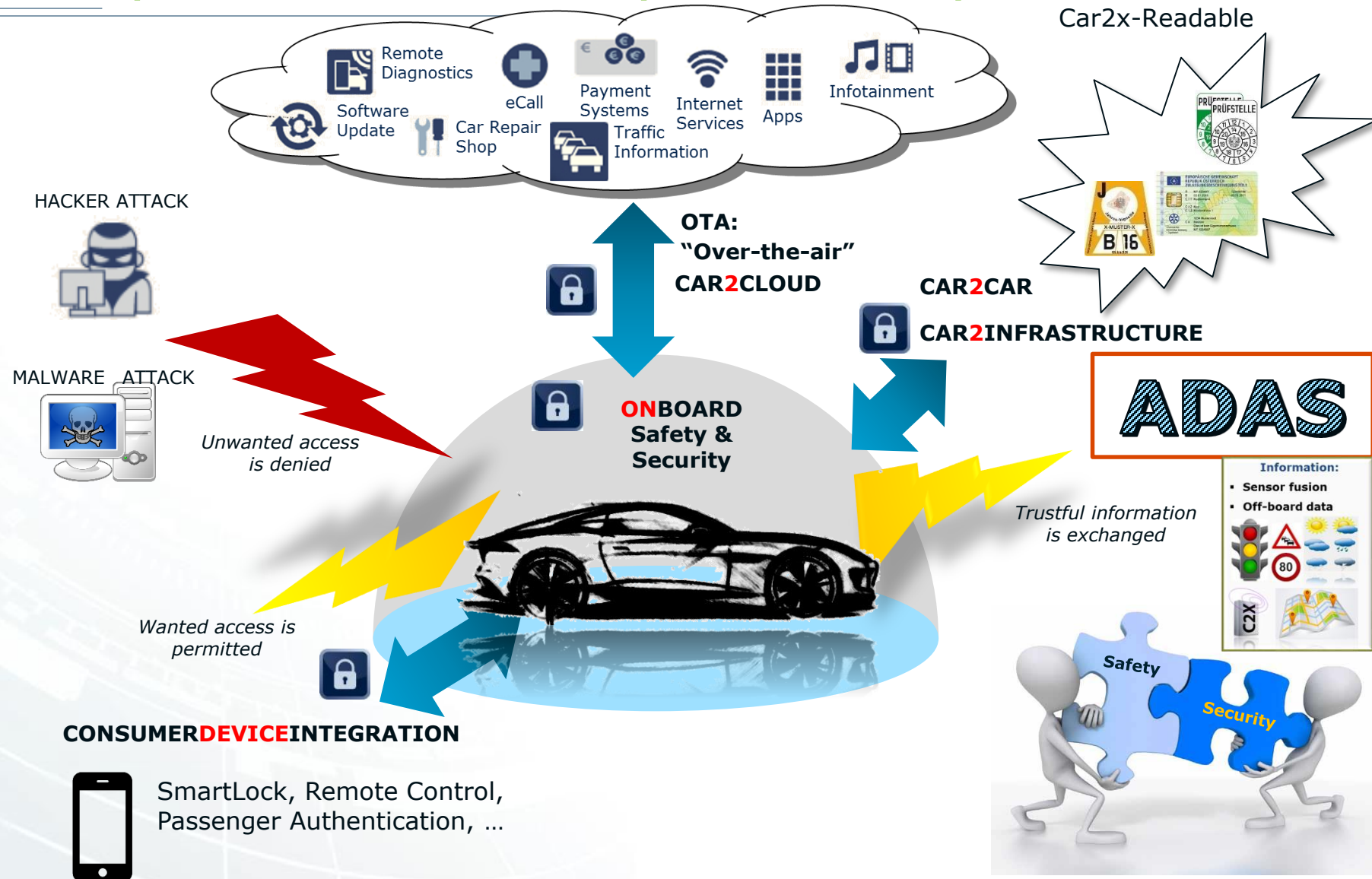
Asia
Market
Growth

Safety &
autonomous
driving, Artificial
Intelligence

ring & Technical Fields

Individual Mobility

Connectivity vs Vehicle Safety & Security





Thank You



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