COMMITTED WITH INNOVATION CONNECTED TO THE FUTURE



Automotive industry: transformation & challenges Jornades Mobilitat URV Decembre.2018

AGENDA





Group Highlights

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Automotive Tier 1

Established in 1949 in Barcelona

Global partners with Panasonic

Decades of experience supplying all major OEMs

Global company

7,8% of sales invested in R&D





A higher technological company





Business Units

UNDERHOOD SYSTEMS



 Washer Systems Sensor Cleaning System

COMMERCIAL VEHICLES

Exterior Mirrors

- Interior Mirrors
- Camera Monitoring Systems
- Communication Modules



ADVANCED COMMUNICATIONS



- Communication Modules
- Integrated Antennas
- Smart Connectivity Modules

eMOBILITY



- Battery Management Systems
- On Board Charger

ADAS





 Camera Monitoring Systems



Cameras



REAR VIEW SYSTEMS



- Exterior Mirrors
- Interior Mirrors

COMMAND & CONTROL



- Shifter systems
- Parking Brake Systems

DOOR & SEAT SYSTEMS





• Light Cables



Automotive industry is suffering its biggest transformation...



...since the last 50 years

Automotive Industry Transformation

These are the four pillars driving the **disruption** in the automotive industry:





Connected Vehicles

An increasing share of vehicles will be connected globally:





Connected Vehicles

Cellular technologies in automotive





Connected Vehicles

Improved internal & external connectivity will make modern vehicles vulnerable to an increasing number of cyber threats:

Cybersecurity threat vectors



Action items for integral security

Secure processing (secure boot, runtime integrity, OTA updates)

Secure network (message authentication, CAN ID killer, distributed intrusion detection)

Secure gateway (domain isolation, firewalls/filters, centralized intrusion detection)

Secure interfaces (secure M2M authentication, secure key storage)



Autonomous Driving

The four technologies that make autonomous driving possible are:



Autonomous Driving

We do not know when & how much... but it happens!





Shared Mobility

Ride sharing services are forecasted to continue growing at a fast pace, attracting massive capital:



Autonomous driving capabilities will accelerate blurring the lines between today's mobility business models and use cases:

Present

Taxi

For-Hire

Ride-hailing

Rental

Car sharing

Owner/

Driver

Future

Autonomous

on-demand

mobility

service

Owner/ Driver



Shared Mobility

Vehicle sales for new mobility services are expected to exceed 10% of new car sales by 2025 in China, the US and the EU:



Share of vehicle sales for New Mobility¹⁾ [% passenger car sales]

WHY?

- Changes in car ownership patterns
- Growing urbanization
- Enhancements in technology & mobility business models

FUTURE

RoboCabs could drive a significantly larger share of sales to new mobility

1) Includes forecast for car sharing, ride hailing, ride sharing, and Robocabs. Does not include sales for conventional taxis or rental car fleets Roland Berger



Electrified Vehicles

Powertrain electrification adoption will be influenced by push and pull factors that have different levels of influence by region:



Lower battery costs and potentially rising oil prices may drive electrification penetration in the United States around 20% by 2025.



Electrification in Europe varies depending on **CO2 emission targets**. Share could reach between 20% and 32% for 2025.



China New Energy Vehicles (NEV) market with significant growth forecasted. Electrified vehicles penetration could reach high levels here, with shares between 29% and 47%.

Main Drivers



Economics/ Cost Ownership





Technology Availability



Growing importance of electronics in HMI

From consumer to auto

Growth of displays and new passenger interface technologies

Personal and auto devices integration

Focus on infotainment







New interiors concept designs



IT & consumer moving into auto



LG Electronics bid for Automotive comp. ZKW





Samsung buys Harmann International & Magnetti Marelli Panasonic

Apple has more self-driving cars than anyone else.

NVDIA invest. in China self driving start up Jing Chi

BROADCOM

Broadcomm try over Qualcomm (130B\$)



Intel acquisition of Mobileye (15,3B\$)

Panasonic

Panasonic investment in Ficosa

Toyota, Panasonic joint venture to develop EV batteries

Sony focused on auto Tier2 components

"Automotive will ultimately be the next big thing in the information technology sector" - Kim Do-kyun, Samsung Electronics' memory division



GM acquisition of Cruise Automation

SONY

X FICOSA

Increasing SW complexity



F22 Raptor 1.7 MLOC



F-35 Joint Strike Fighter 5.7 MLOC



Boeing's 787 Dreamliner 6,5 MLOC

Modern premium car 100 MLOC, 70-100 ECUs *MLOC = Million lines of code



http://spectrum.ieee.org/green-tech/advancedcars/this-car-runs-on-code



Automotive SW new challenges



If cars were build like software...

- Safety ASIL requirements
- No autonomous driving without **connectivity**
- Cybersecurity
- Upgradable
- Adaptive, self learning
- Requirements **mgmt** and **testing**
- **Decoupling HW-SW**. Virtualization
- Re-thinking current architecture
 - 70 ECU's vs central
 - High speed Bus architecture
 - Cloud vs in-vehicle
 - Managing images vs data
 - Smart sensors



Software is a battleground



Facing the challenges of the new automotive industry



Product vitality index



Remarks

- 65% of future sales driven by new projects and technologies not in production
- From 1,1billion Sales 2016 to 1,5billion 2020





Questions for the future auto industry,

if fully autonomous (L5) driving becomes reality

No traffic lights needed?

People won't own their cars ? Driver's license will go away ? Auto insurance will go away ? Car finance industry will go away ? Demand for taxi & truck drivers ? Higher usage rate, less cars ?

Higher usage rate, less parking space? More alcohol sold in bars-restaurants? More racing, replace emotions? Loss admin revenue on traffic tickets? High disappointment if accident happens? Easy transportation for handicapped & older people? Increased productivity during transportation? No more police vehicle chases ? Vehicles filled with advertisement? Less lawyers?



