Software Defined Car- A Mercedes-Benz View

Dr. Rose Sturm

Today`s journey

Mercedes-Benz Strategy

Mercedes-Benz MBOS

Requirements for future Software defined Cars - Research perspective

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Let's start with the essence of our strategy.

WE WILL BUILD THE WORLD'S MOST DESIRABLE CARS

Think	**Focus**	**Expand**	**Embrace**	**Lead**	**Lower**
and act like a luxury brand	on profitable growth	customer base by growing top-end luxury	customers and grow lifetime revenues	in electric drive and digital experience	cost base, improve industrial footprint and increase supply chain resilience

Driven by a highly qualified and motivated team
Sustainability, integrity and diversity as our foundation

Our current fully electric portfolio:
And there is more to come!

EQA

EQB

EQE
EQE AMG

EQE SUV
EQE SUV AMG

EQS
EQS AMG

EQS SUV

Mercedes-Maybach
EQS SUV

EQV

Mercedes-Benz

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The fundamental building principles

WE ARE THE
ARCHITECTS

SPECIFY

DESIGN

DEVELOP

PROCURE/
PARTNER

INTEGRATE

UPGRADE

The fundamental building principles

1. PURPOSE-BUILT
AND OPEN TO PARTNERS

3. PRIVACY-BY-DESIGN
FROM THE VERY BEGINNING

2. PERSONALIZED SERVICES
THROUGH ONE UNIQUE MERCEDES
ME ID

4. FULL OVER-THE-AIR
UPDATABILITY
AND DECOUPLED SOFTWARE
AND HARDWARE RELEASES

All central to our own Mercedes-Benz Operating System MB.OS

**PROPRIETARY
OPERATING SYSTEM**

**FOUR DOMAINS:
INFOTAINMENT, AUTOMATED DRIVING,
BODY & COMFORT, DRIVING & CHARGING**

**SERVICE-ORIENTED
CHIP-TO-CLOUD ARCHITECTURE**

It's about the operating system of our entire business

Devices

MB Intelligent Cloud & me ID

Product Creation

Operations

Commerce

MB.OS
INFOTAINMENT
AUTOMATED DRIVING
BODY & COMFORT
DRIVING & CHARGING

We're connecting the elements to build an **INTEGRATED NETWORK** makes us **MORE EFFICIENT** and permanently **MORE PROFITABLE**

Up to 350 sensors, e.g.

- environment light
- distances
- speed
- acceleration
- rain
- themperature
- seat use
- eye blink

OTA update (including new functions)

adaptable AI

10 massage programms

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What happend?

2007:
E 320 BlueTEC Limousine

Mechanical Engineering driven
SW mapped to ECUs
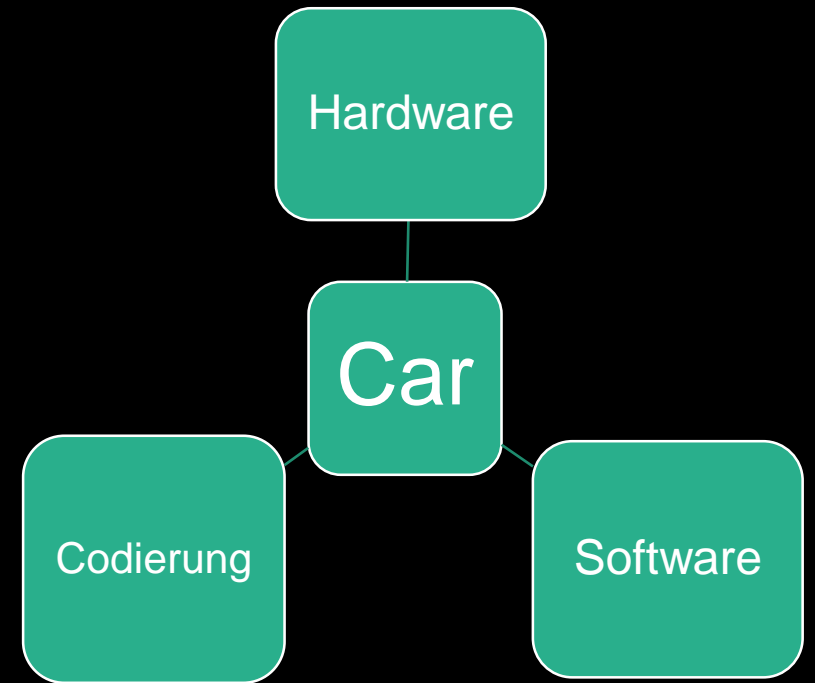   – new in each model

2022: EQS

09/2013: Mercedes.me connect
          Car - Edge - Fogg – Cloud

2019: MBUX (Integrated Infotainment)

In progress: MB.OS

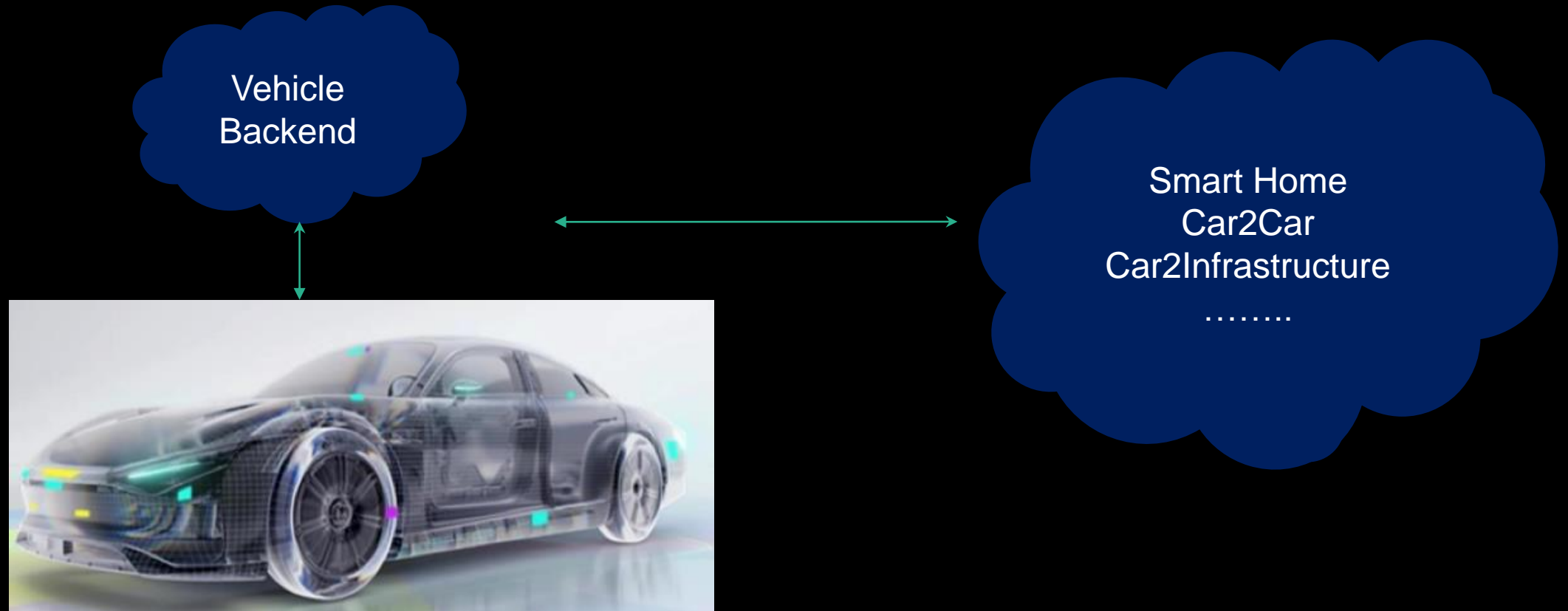# A car will be and allready is a complex SW system

- One or more supercomputer inside
- A lot of additional ECUs
- Several zone controller
- Many actors and sensors

- „Spider web" of dependencies
- actors / sensors data is used in parallel
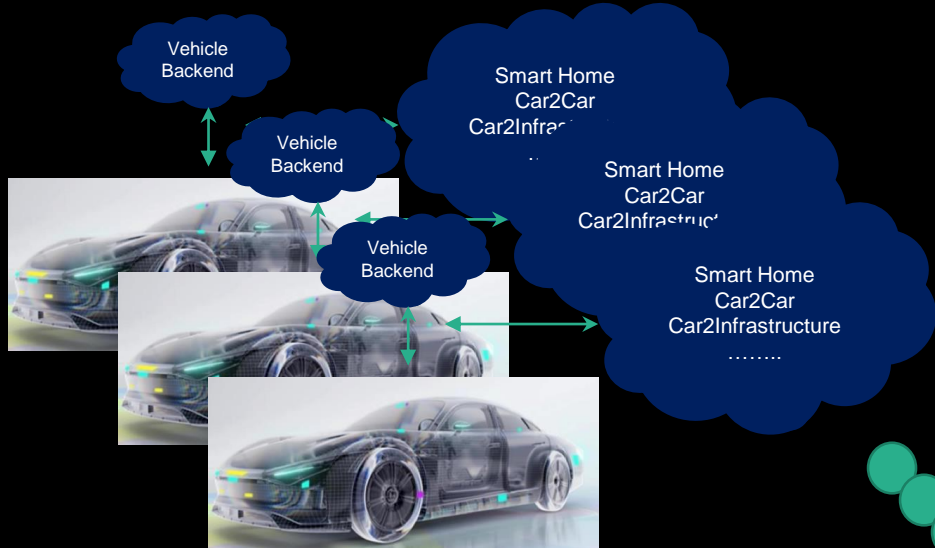
- Maybe most components will be changed over lifetime

Adding vehicle backend and ecosystem

Vehicle Backend

Smart Home
Car2Car
Car2Infrastructure
……..

And now: multiply by several millions

Vehicle Backend

Vehicle Backend

Vehicle Backend

Smart Home
Car2Car
Car2Infrastructure

Smart Home
Car2Car
Car2Infrastructure
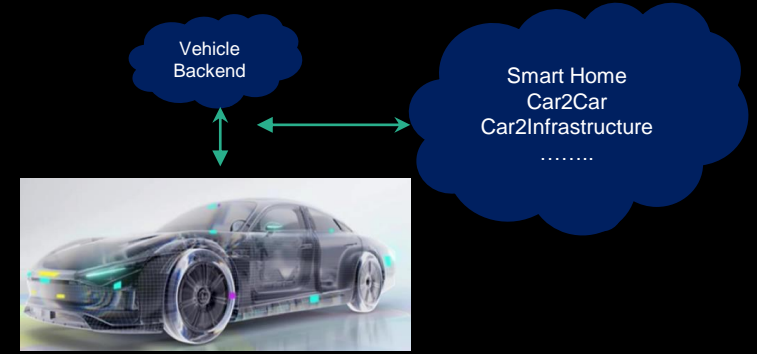
Smart Home
Car2Car
Car2Infrastructure
....

More than 20 years in customer hand

Each car is individual – even more over time

Every time up-to-date

Cars produced per year:
2020: 2423724
2021: 2341682
2022: 2504665

International

Vehicle Backend

Smart Home
Car2Car
Car2Infrastructure
....

Promotion: car-lifetime oriented development

Security

Updateable / upgradable

Safety

Diagnosable / repairable

Resilience

Payable

Homologation

International aspects

Integration of external developed functions

Some topics adressed in sofDCar

(software defined for embedded to cloud)

- Version- and configuration management (also including „codierung")
  - …. some people may call it digital Twin
- Function mapping/shiping
- API management
- Hardware abstraction
- Global and early integration testing
- Production friendly software architecture
- Software picking in production
- Bringing together HW and SW diagnostics
- Anonymity
- …

Open Source

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Further important points

- Each supplier wants his part in car SW

- Open Source in Cars

➔Integration and maintenance over lifetime???????

And:

- China politics

- USA politics

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Summary:

Many open topics for resarch