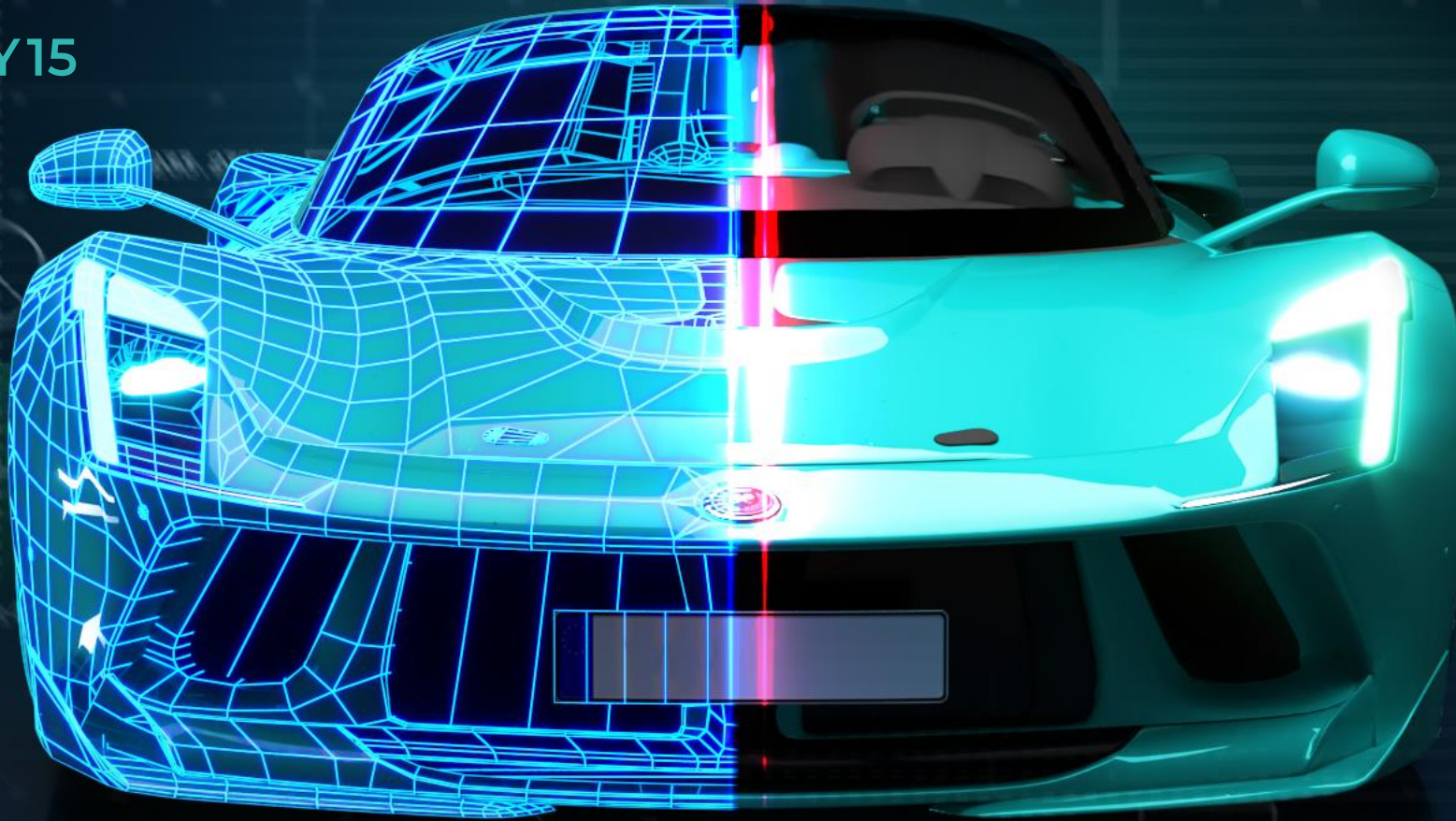


Bridging the Gap

HBK's Innovative Validation Workflow combining Simulation and Physical Testing



ZPS 2024, MAY 15



Christof Salcher
Product Manager
HBK

The Plot

- ▲ HBK's Vision
- ▲ Durability
- ▲ Vehicle Dynamics / Ride & Handling / ADAS
- ▲ NVH
- ▲ Summary



HBK's Vision

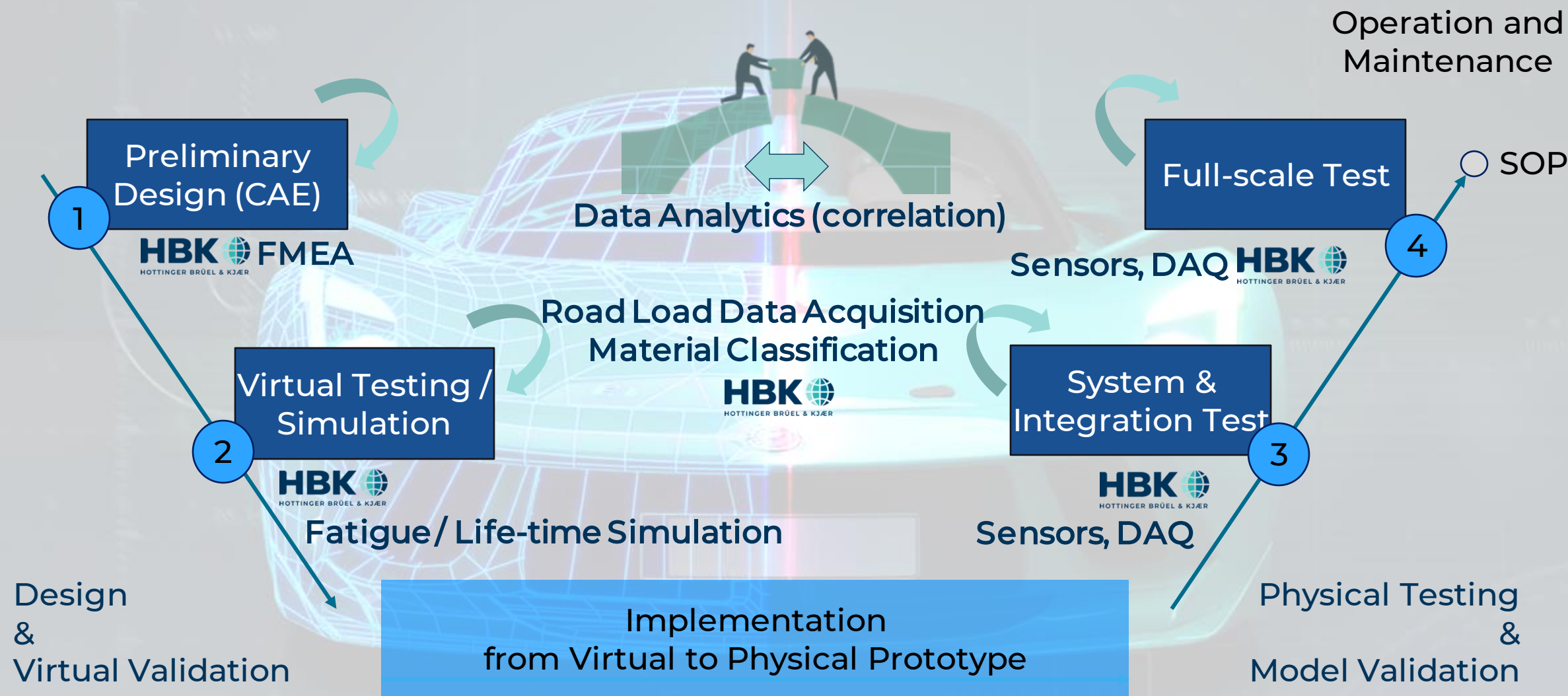
Exceptional tools gaining data insights for quick decision making,
elevating our customers to create solutions
for a cleaner, healthier (zero emission),
safer (zero accident)
world.

**EMPOWER
THE INNOVATORS**

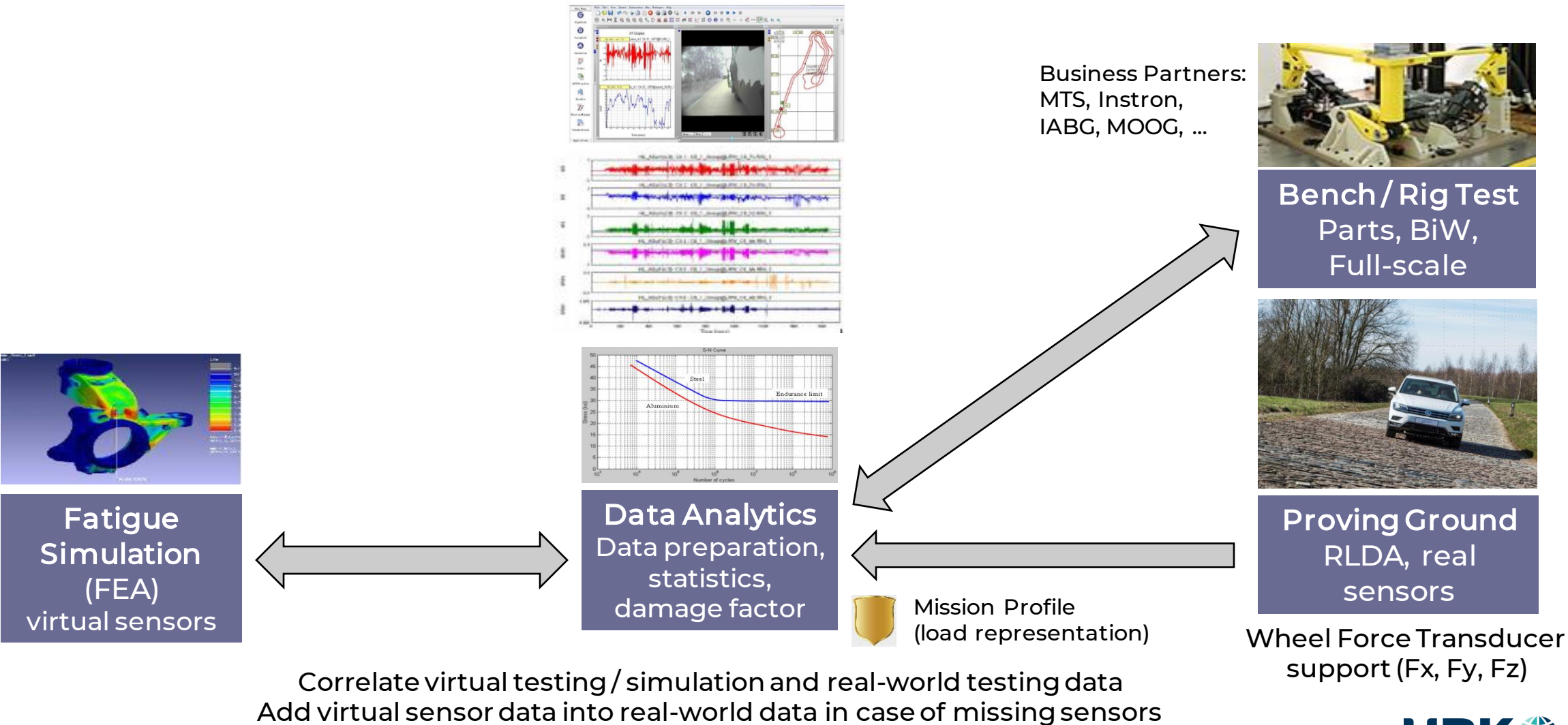


Durability

Structural Durability Validation Workflow



Structural Durability Validation Workflow

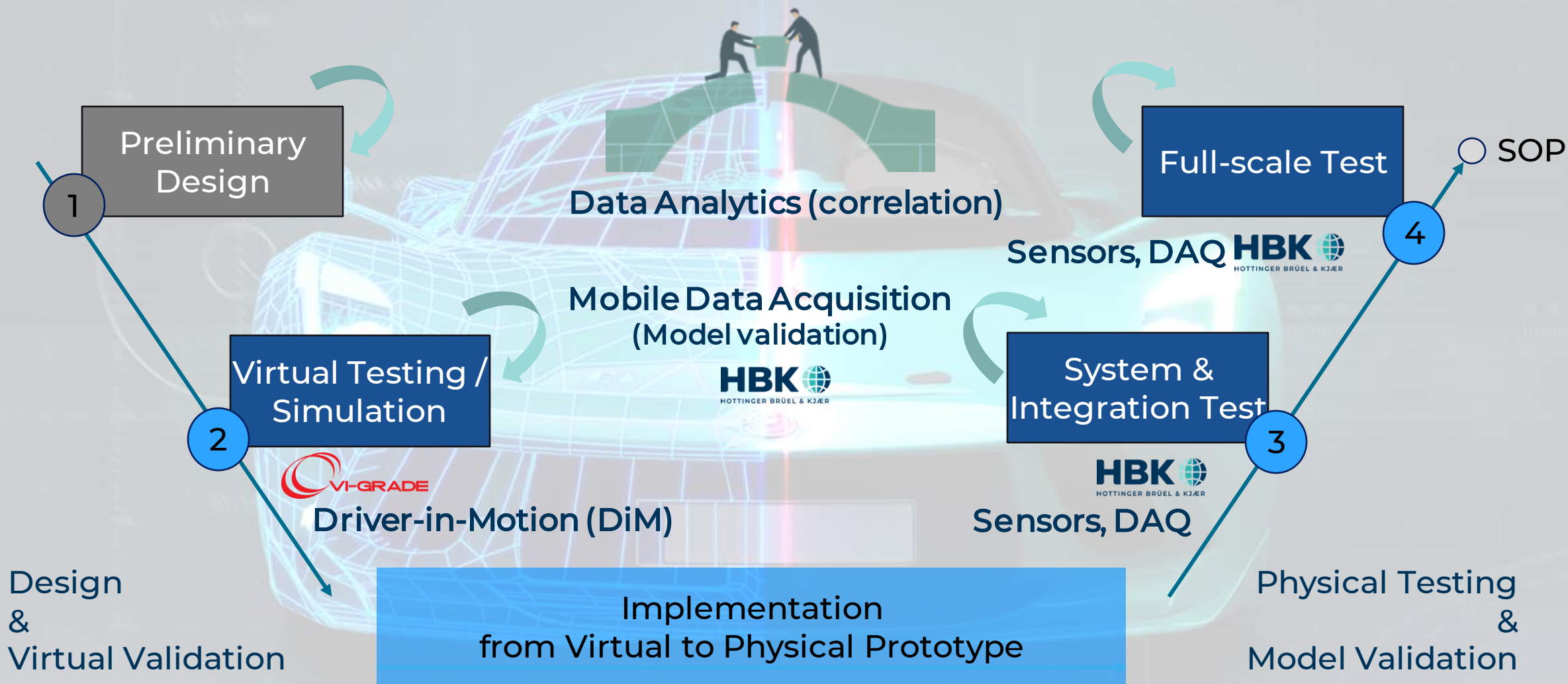


Vehicle Dynamics

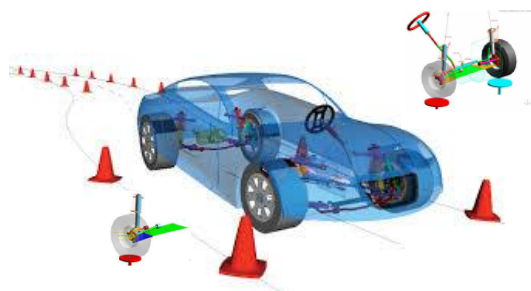
Ride & Handling

ADAS

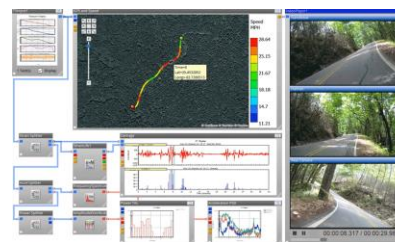
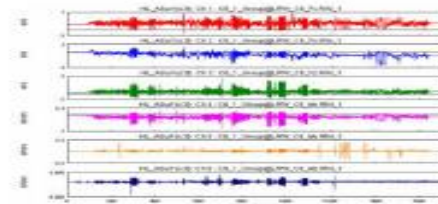
Vehicle Dynamics / Ride & Handling / ADAS Workflow



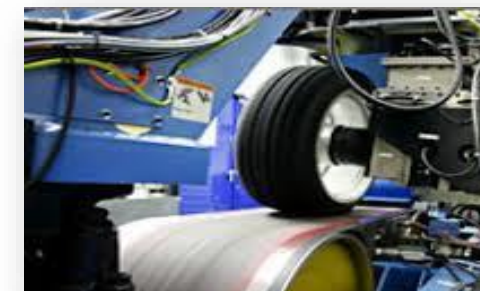
Vehicle Dynamics / Ride & Handling Setup



**Simulation
Virtual Testing
(MBS, SiL)**



**Data Analytics
Test validation
Model optimization**



**Bench Test
(parts)**

Tire/road, cornering, traction,
Brakes, dynamic roller test



**Proving ground
(driver, parts, vehicle)**

IMU, WFT support (Fx, Fy, Fz)
Long / lateral speed,
Slip angles/ratio, incl. angles



**Lab Simulation
Driver in Motion
(DiM)**

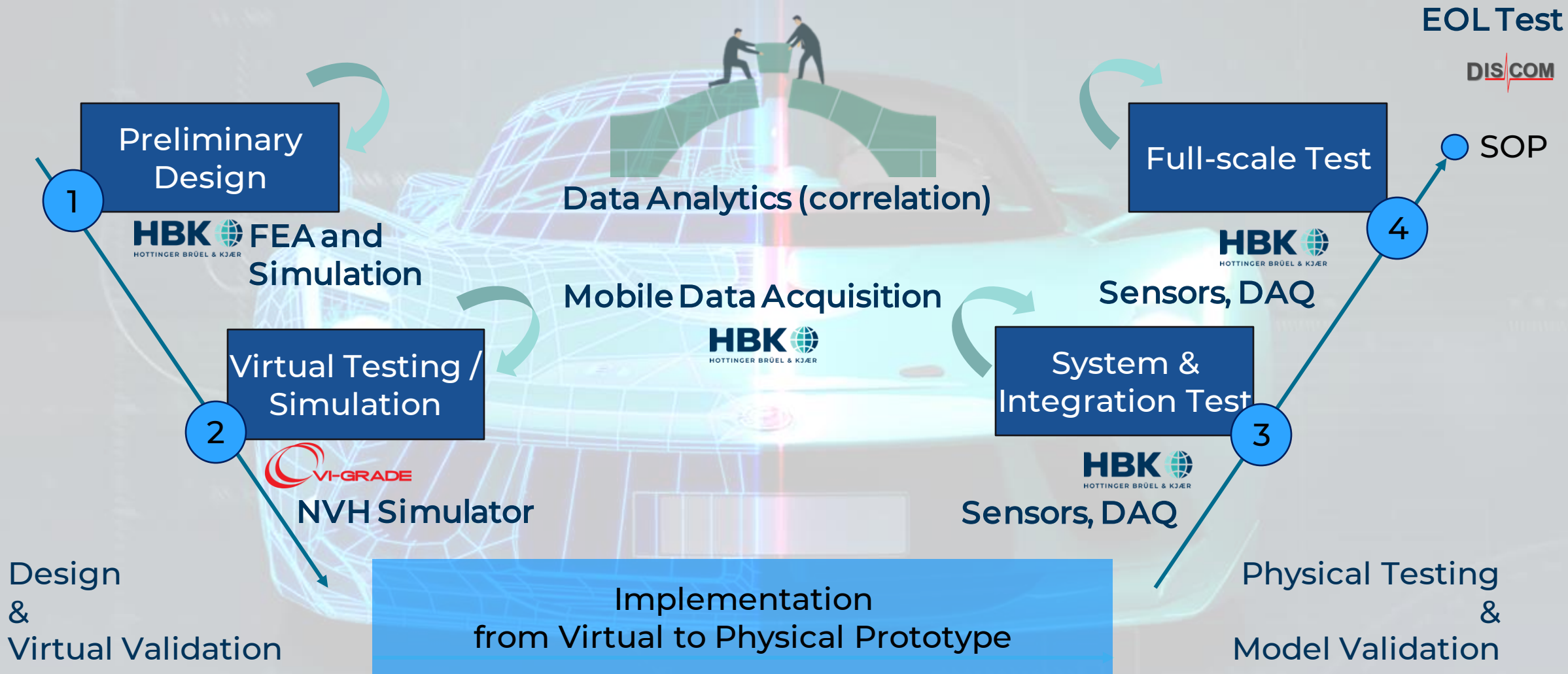


Realistic scenario
Driver behavior, ADAS,
HMI

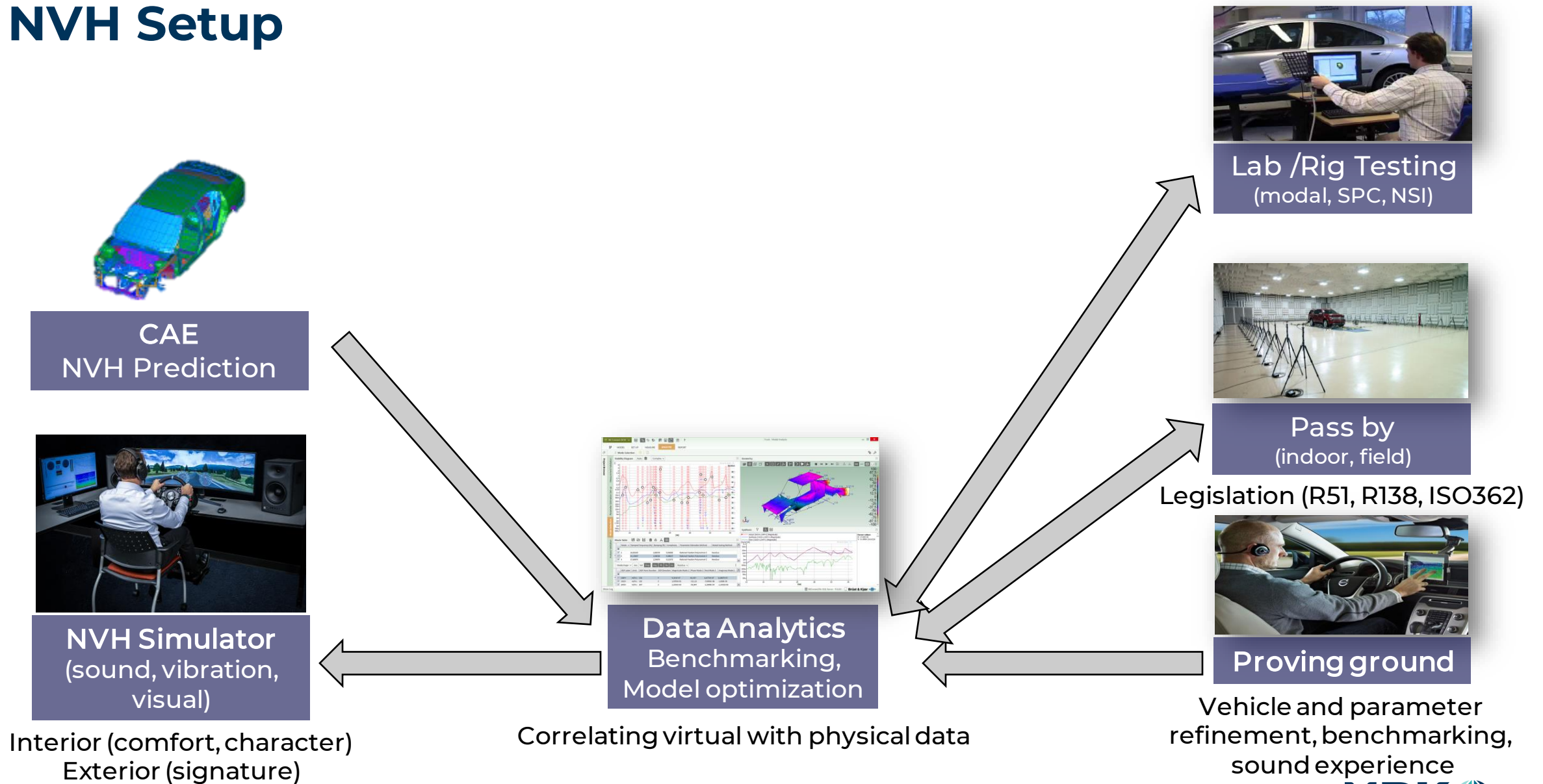
Correlating virtual with physical data

NVH

NVH Validation Workflow

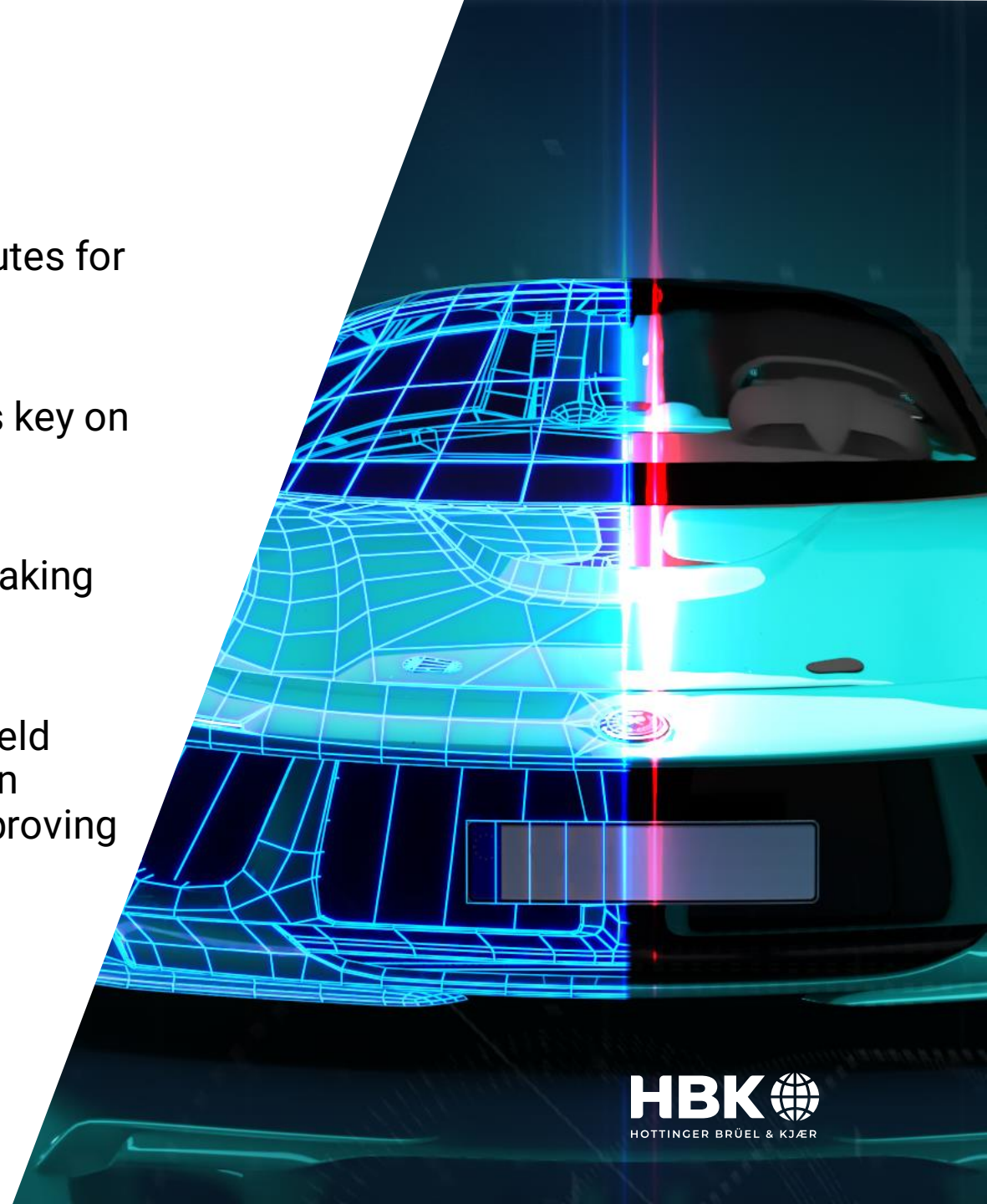


NVH Setup



Summary

- ▲ Durability, Ride & Handling, ADAS, NVH are main attributes for end users (quality, reliability, safety, comfort, DNA)
- ▲ Correlating simulation data *and* physical testing data is key on our “Road to Zero Prototype”
- ▲ A seamless & efficient workflow speeds up decision making and reduces cost
- ▲ Hypothesis: networked vehicles will generate tons of field operation data to be analyzed by AI/ML, getting an even sharper picture of true customer use cases, further improving validation workflow and time to market!



Thank you very much

HBK - Empower The Innovators



Let's connect and stay in contact