

Gregor Nitsche



- Senior researcher at German Aerospace Center (DLR) (Deutsches Zentrum für Luft- und Raumfahrt e.V)
- Team-Lead of the Monitoring and Diagnosis Team at Institute of Systems Engineering for Future Mobility



- Research topics:
 - formal specification, verification, and runtime validation
 - extra-functional (performance) properties
 - development and integration of runtime monitors
 - embedded and distributed microelectronic and embedded systems
 - SDV-Architectures (Mixed-critical HW/SW systems)



-  UP2DATE4SDV Project-Coordinator (HORIZON-RIA / CINEA)

MPP: UP2DATE4SDV: Enabling safe & secure modular UPdates, UPgrades and DynAmic Task reallocation and Execution for Software-Defined Vehicles



<https://linkedin.com/company/up2date4sdv>

Gregor Nitsche (DLR), 21.04.2026

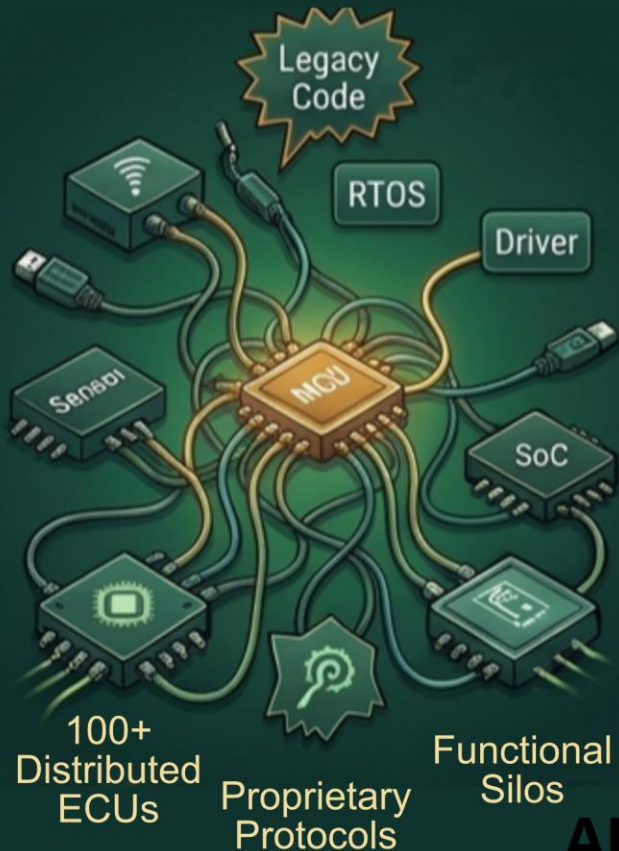


Funded by
the European Union

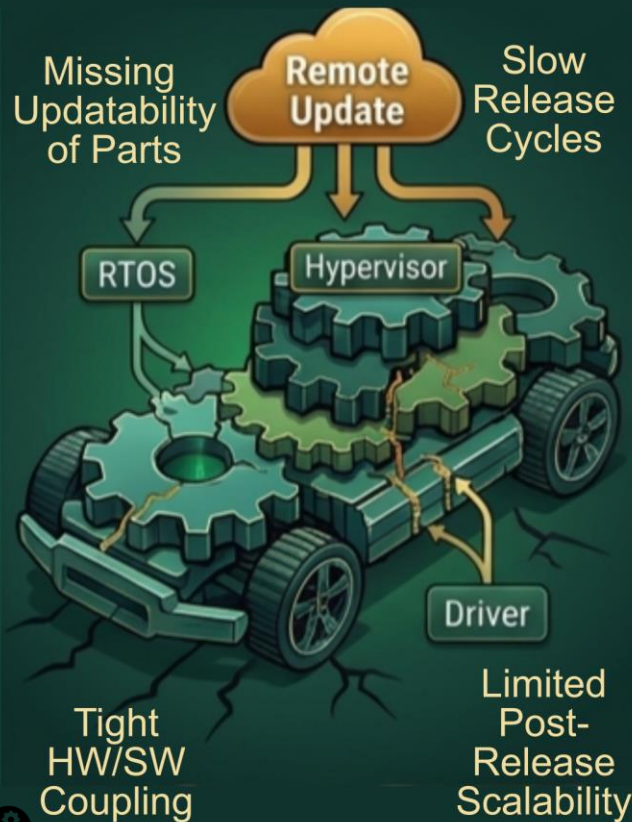


The Status Quo: The E/E Architecture Deadlock

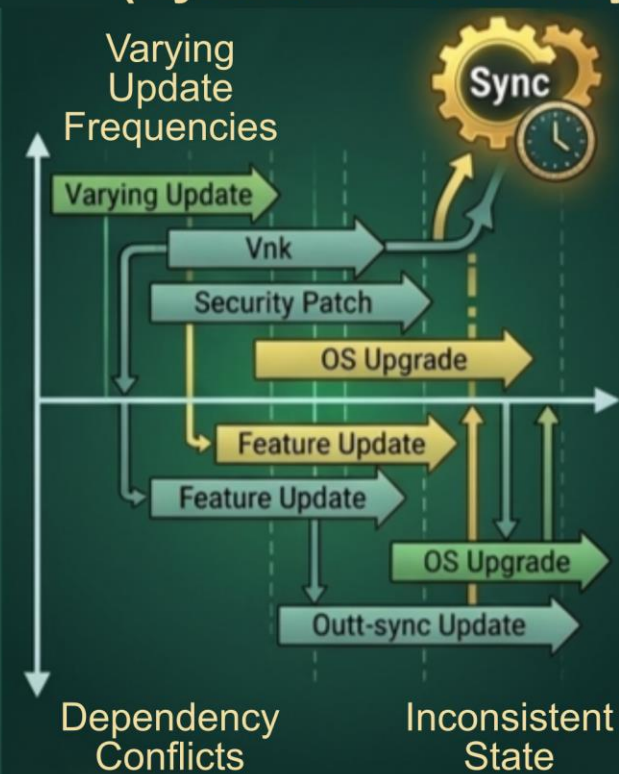
1. Composition Chaos (Heterogeneity)



2. The Rigidity Trap (Updatability)



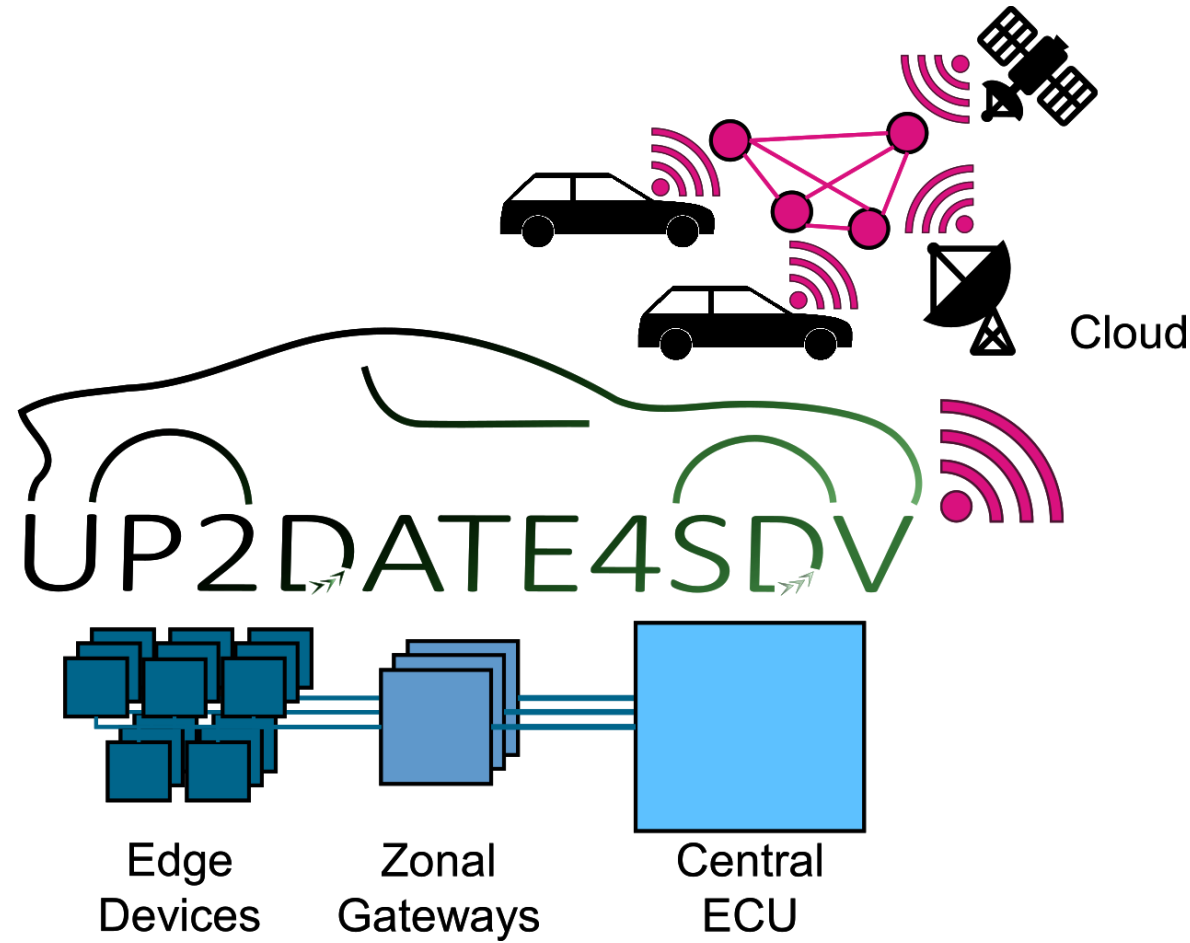
3. The Synchronization Crisis (System Consistency)



4. The Certification Nightmare (Safety & Security)

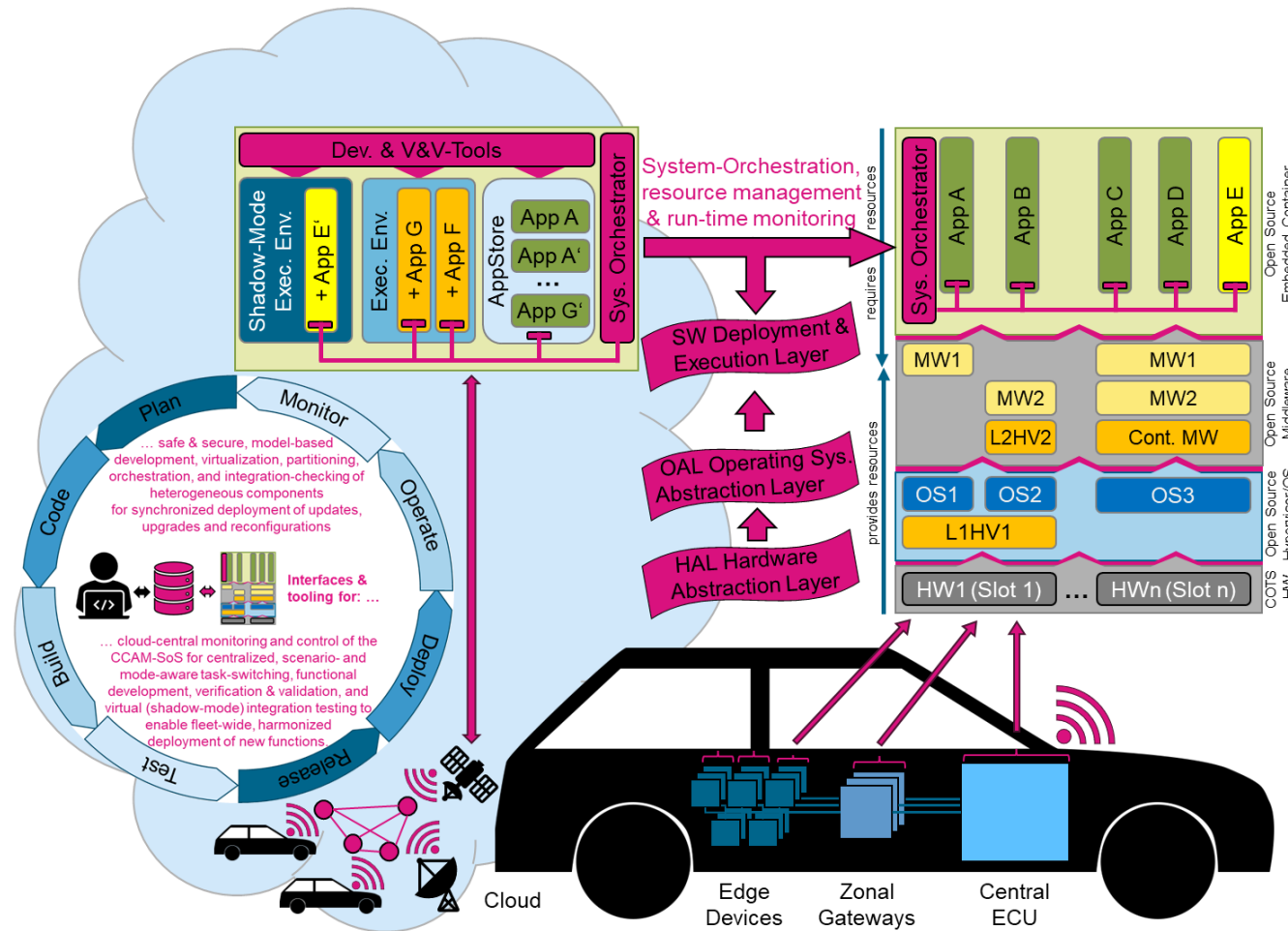


Customer-Motivation: SD-CCAM-V



- Cooperative autonomous cars
- Communicating infrastructure
- Flexible vehicle functions
 - Personalization
 - Geo-regional adaptation
 - Longevity
 - Safety and security
- Cost-efficiency
- Shorter innovation cycles

Goal

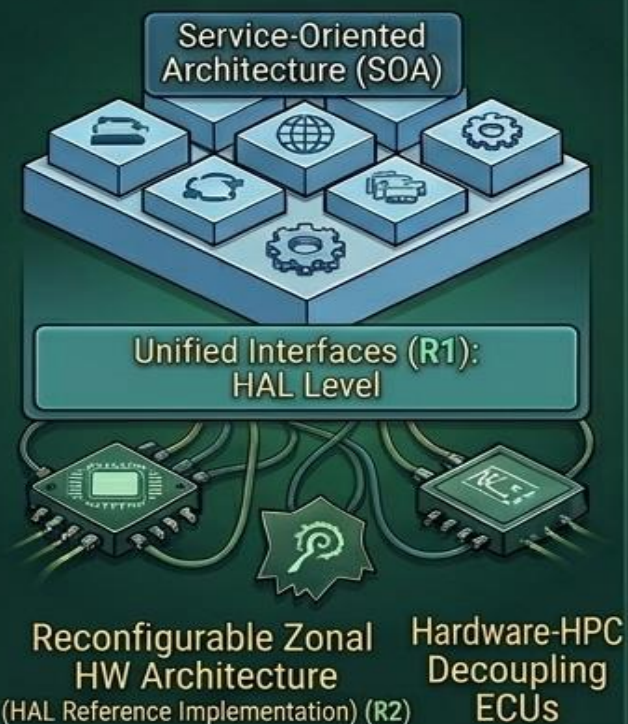


“UP2DATE4SDV aims

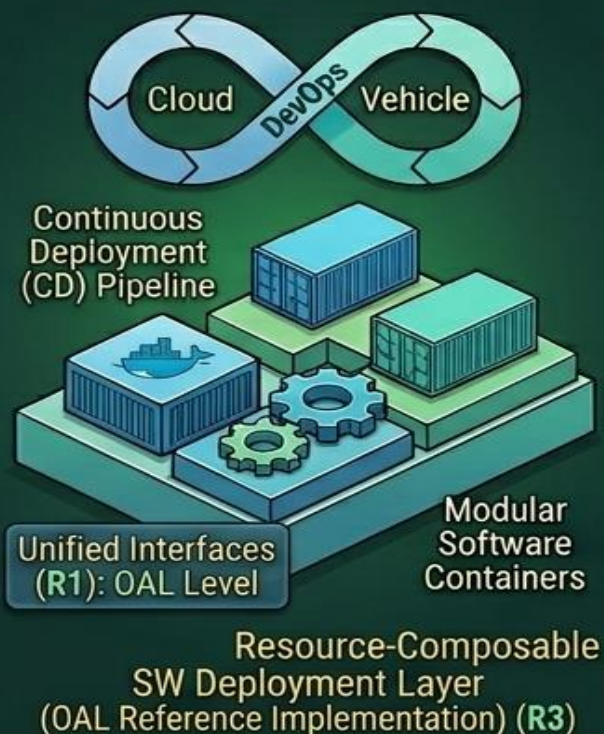
... to develop a **comprehensive ecosystem** for seamless and efficient **software-updates, hardware-upgrades, and situation-dependent reconfigurations** of software-defined CCAM vehicles”

UP2DATE4SDV: Enabling the Reconfigurable SDV Platform

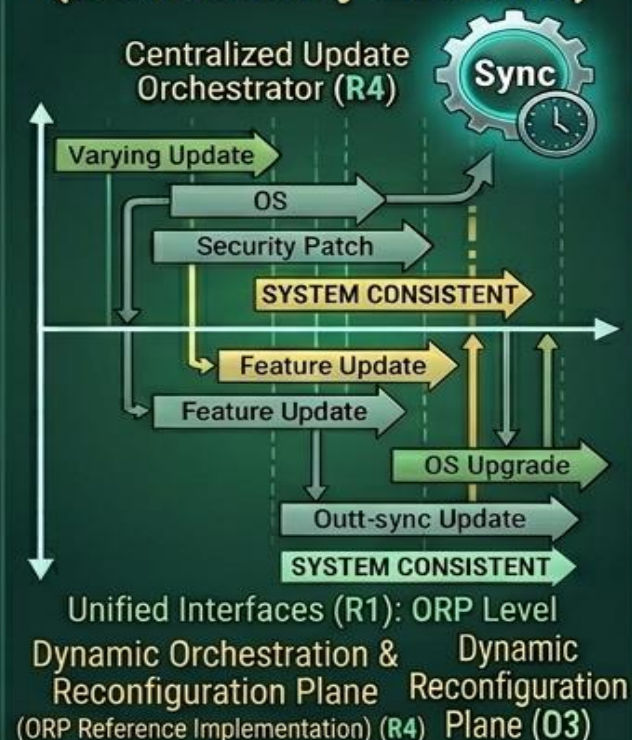
1. Modular Abstraction Layer (Heterogeneity Solution)



2. End-to-End Updatability (Rigidity Solution)



3. Atomic Orchestration Plane (Consistency Solution)



4. Continuous Certification (Validation Solution)



Validation, Standards, & Impact

CCAM Use Case Validation (O6)

Research and Industry Demonstrator for Collective & Adaptive Perception (R7)



Ecosystem & Standardization (O7)

SDV Initiatives

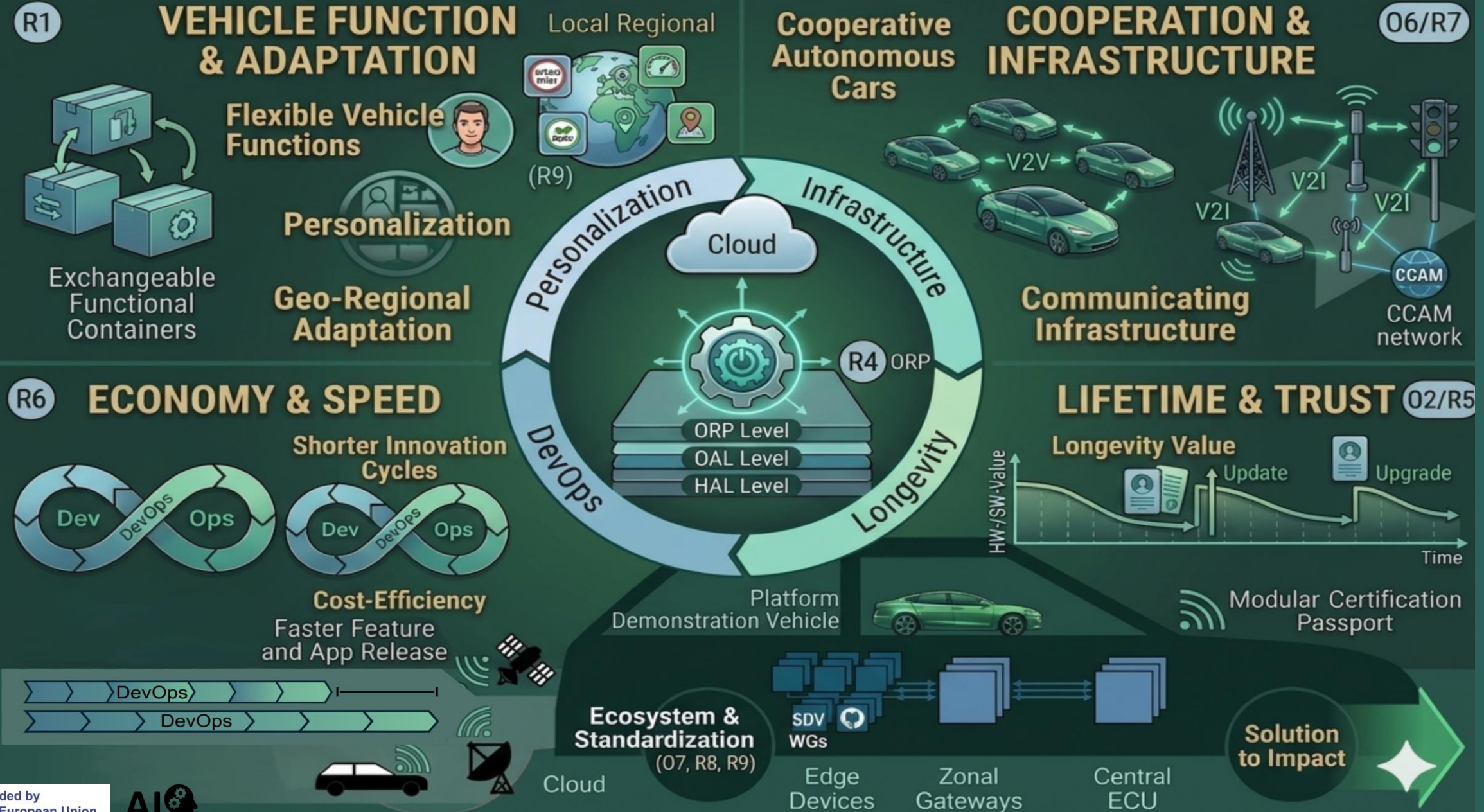
CCAM initiatives

CCAM initiatives



Open-Source Contributions to the SDV Ecosystem (R9)

UP2DATE4SDV: Ecosystem-Wide Impact



Thanks to:





Gregor Nitsche

+49 441 770507-354

gregor.nitsche@dlr.de

<https://DLR.de>

German Aerospace Center (DLR)

Deutsches Zentrum für Luft- und Raumfahrt e. V.

Institute of Systems Engineering for Future Mobility (SE)

Escherweg 2 | 26121 Oldenburg

THANK YOU