### FEV Signature Solutions **Systems Engineering - CUBE**

# Providing you with a Backbone for Modern Systems Engineering for Cyber-Physical Solutions

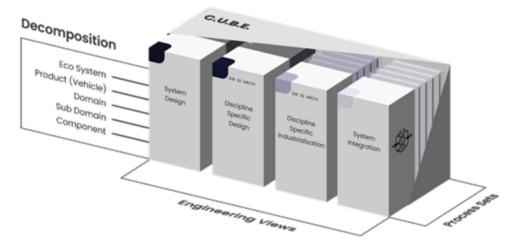
#### **FEV offers**

- End-to-End Systems Engineering Excellence: From vision to SOP.
   CUBE ensures clarity, traceability, and speed with integrated toolchains (ALM/PLM, modeling, development/simulation, V&V, variants).
- Beyond the V-Model: CUBE extends the V-Model: Develop in parallel, reuse artifacts, integrate seamlessly – fewer late-stage errors.
- Cross-Industry Applicability: For Automotive, Aerospace, Energy, Rail, and Defense. Meets safety, security, and quality standards while driving innovation.
- Training & Consulting for MBSE: Training and consulting on MBSE and CUBE building a shared, practical engineering language.
- Tailored Processes for Al-Ready Engineering: Tailored processes improve efficiency and quality, a solid foundation to scale Al in development.



#### **Why FEV**

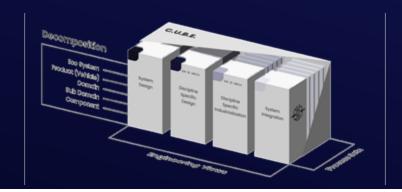
- Our Engineering Backbone 'CUBE' is our USP that sets us apart. OEMs and Tierls around the world value us for our holistic approach for +10 years.
- We deployed CUBE in +100 series productionand research projects showcasing our abilities and share this on established conferences.
- Our whole organization embeds CUBE in daily operation. Thereby we boost clarity, reuse of work and alignment in our teams.

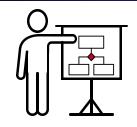


#### Reference projects

FCV propulsion

#### SYSTEMS ENGINEERING





#### Process & Method Consulting

(in systems engineering incl. MBSE & requirements management)



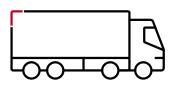
#### Requirements & Architecture Management

(model-based systems engineering operationalization and method development)



#### Software-defined Vehicle

(strategy development & organizational establishment)



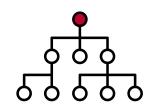
#### Full Scope Systems Engineering roll-out

(model-based approach for crossdiscipline development at truck OEM)



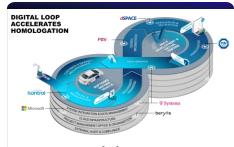
#### Automated Testcase Generation

(model- & scenario-based testcase derivation on vehicle level for ADAS)



#### Variant Management incl. full traceability

(model-based systems engineering for autonomous driving system)



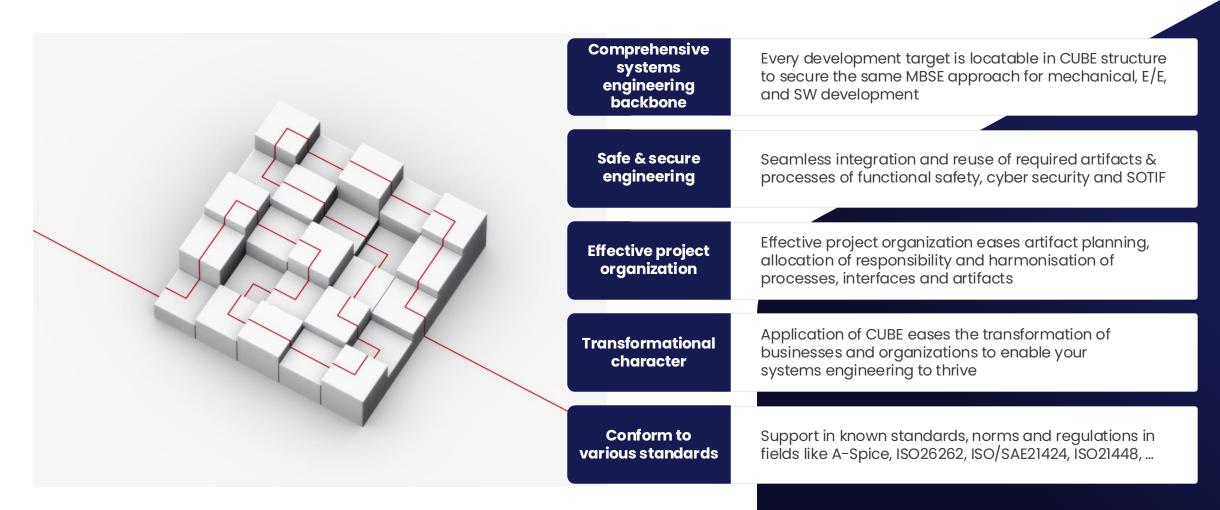
#### Digiloop (see <u>Webpage</u>)

(transformation of traditional, physical vehicle testing into sophisticated, virtual platform)

# Structured engineering and reusable work products help to reduce development costs



SYSTEMS ENGINEERING AS BASE OF INTERDISCIPLINARY PRODUCT DEVELOPMENT



# We apply proven processes, methods & tools for series grade design and industrialization – including model-based and text-based approaches



#### **SELECTION OF OUR MAIN ACTIVITIES**

| System Design   |  |  | Discipline-specific Design & Industrialization   |   |   |  | System Integration                                       |   |
|---|--|--|--|---|---|--|--|---|
| Requirement<br>elicitation from<br>regulations &<br>standards for<br>homologation | Stakeholder value,<br>Use-Case,<br>Scenarios and<br>System Feature<br>definition       |  | Software  SW-module & component requirement analysis & architecture  Al enhanced software development & DevOps | Vehicle topology &  | Diagnostic concept  | (Scenario-based) automated test case design from system models | Sign-off:<br>Integration,<br>calibration and<br>approval |   |
| Operating principle and architecture definition with SysML & DSLs                 | Functional safety<br>& cyber security<br>(incl. HARA and<br>TARA) synergy<br>and reuse |  |  |   | network design<br>w/ EE & HW<br>requirements                                      | & architecture<br>definition                                   | SiL: SW-module integration                               | Vehicle: SWF<br>integration                   |
|   |  |  | Build & package management, Automation (CI/CD)   | Functional Safety and Cyber Security in Software Architecture | Schematic and<br>2D/3D wiring<br>harness design<br>w/ CAE analysis<br>for harness | Functional<br>Safety and                                       | MiL: Model<br>integration                                | HiL: SWC/HW<br>integration                    |
| GenAl enhanced requirement analysis &   | Product-Line<br>Engineering &<br>Variant<br>Management                                 |  |  |   |   | Cyber Security<br>in E/E<br>Architecture                       | Test<br>Strategy<br>development                          | Functional Safety<br>Testing &<br>Penetration |
| specification<br>   |  |  | Mechanics Interface with mechanical requirements and design for each domain                                    |   |   |  | and execution  | Testing<br>                                   |

SYS interface with subdomains through vertical traceability and SYS-domain mapping

Requirements management

Architecture management

Quality management

Traceability | Configuration & Release Management | Variant Management | Project Management & Planning

# Get in touch with us for further information



www.fev.com/en/ signature-solutions