

# Driving the Future: Accelerating Vehicle Development Speed through Cross-Industry Synergies

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The accelerating transformation of the automotive industry, driven by electrification, digitalization, software-defined architectures, and increasingly dynamic global regulations creates unprecedented pressure on development speed. While Western OEMs continue to rely on sequential and verification-heavy development models, leading Chinese manufacturers are demonstrating that entire vehicle programs can be completed in nearly half the time traditionally required.

Their ability to achieve 24–40-month development cycles and maintain a structural 20–30% cost advantage is rooted not in isolated process steps, but in a fundamentally different development philosophy that prioritizes decisiveness, virtualization, and pragmatism. Against this backdrop, the present paper examines how a similar acceleration can be achieved within Western engineering organizations by transferring key principles from China-Speed and by deploying advanced virtual, model-based, and AI-enabled toolchains available in AVL's development ecosystem.

Accelerating development speed requires a clear departure from traditional, sequential engineering practices and a shift toward fast, stable decision-making, early commitment, and strong reliance on virtual validation. This shift is characterized by trusting high-fidelity simulations as the primary basis for design release, reducing the role of physical prototypes to targeted confirmation tasks. At the same time, specifications are derived from predominant use-cases rather than rare corner scenarios, preventing unnecessary complexity and enabling earlier architectural freeze. Projects rely on proven technologies from the outset, while functional differentiation is increasingly realized through software and OTA updates after SOP. Supplier interaction changes accordingly: partners are integrated during concept definition to secure early feasibility alignment and reduce downstream negotiation cycles. Across all development phases these mindset elements translate into greater parallelization, controlled late-phase flexibility, and a pragmatic focus on integration over exploration. Together, they form the behavioral foundation needed to achieve significantly shorter development cycles without compromising technical robustness.

To operationalize accelerated development, the paper introduces four AVL toolchains that embed AI and automation directly into critical engineering workflows. AVL Homologation AI™ automates global legislation monitoring and requirement derivation, ensuring compliance keeps pace with development speed. AVL Vehicle Composer™, already proven in cooperation with Hyundai, provides AI-driven concept generation with real-time crash prediction and 3D feasibility checks, reducing early-phase iteration times. AVL TestGEN™ automates test-case creation across SiL, HiL, and vehicle-level environments, achieving higher coverage with significantly reduced engineering effort. AVL DVP Optimizer™ orchestrates real and virtual test resources using AI-based dependency modeling, minimizing prototype vehicles and optimizing test plans.

Together, these methodologies and tools demonstrate how accelerated, first-time-right vehicle development can be achieved through tightly integrated virtual processes, AI-supported decision-making, and cross-industry engineering synergies.

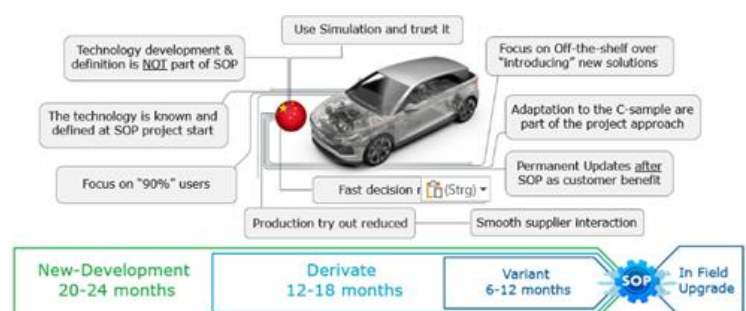


Fig.1 China Speed – mindset requirements for accelerated development