DON'T GET OUTPACED

Why Traditional Automotive Development Needs to Take a Back Seat

FOR MANY DECADES, AUTOMAKERS DEPENDED ON DEVELOPMENT APPROACHES THAT PRIORITIZE DURABILITY, RELIABILITY, AND CONSISTENCY.

But fundamental shifts in the industry have made these approaches inadequate—from how a vehicle is defined and built to the rapid pace of innovation required to remain competitive. Unlike traditional vehicles primarily built around hardware, software-defined vehicles (SDVs) rely heavily on software to manage features and functionality. Staying ahead in the era of SDVs demands speed and agility—and it starts with adapting your approach to development.

Learn why traditional development is no longer sufficient to navigate today's industry challenges and discover alternative approaches to drive innovation.

TRADITIONAL APPROACH:
RELIANCE ON HARDWARE

NEW APPROACH

Adopt digital processes and leverage AI-powered insights that accelerate software-based innovation.

Traditional approaches prioritized hardware and mechanical systems over software, and development cycles spanned as much as six years.

Traditionally, only 10–15% of development resources are focused on embedded software. For software-defined vehicles, this number grows to more than 40%.[1]

In competition against new entrants and EV startups, automakers are navigating a transformed industry that moves at a much faster pace—one that requires shorter development timelines and a focus on software. A hardware-centric model can't deliver this level of responsiveness.

The traditional development approach's reliance on hardware is increasingly a problem today because it fundamentally limits speed, flexibility, and innovation—all of which are essential in the modern automotive landscape.

1. Referenced in BCG's automotive digitization reports

TRADITIONAL APPROACH:
SEQUENTIAL DEVELOPMENT

NEW APPROACH

Implement agile and iterative processes over linear ones to simplify updates and improvements over time.

Traditionally, automotive development follows a waterfall model, involving distinct development stages, with limited flexibility to incorporate changes later in the process. This may have worked in the past for the development of hardware- and mechanical-centric vehicles.

McKinsey reports that typical software development timelines for conventional OEMs exceed 40–50 months from project start to software release.

SDV development, on the other hand, requires a more agile and iterative approach to support continuous updates, frequent feature rollouts, and real-time bug fixes and security patches. Failure to support these requirements will impact competitiveness and customer experiences.

TRADITIONAL APPROACH:
INTERDEPENDENT HARDWARE & SOFTWARE

NEW APPROACH

Traditional approaches didn't allow hardware and software to evolve independently because software was tightly coupled to specific hardware platforms, commonly known as Electronic Circuit Units (ECUs). This setup was slow, costly, and inflexible. While hardware changes can take years, software evolves in a matter of weeks or days as new features and bug fixes are delivered via over-the-air (OTA) updates.

According to Gartner, 50% of new vehicle models will use a zonal or centralized E/E architecture with an in-vehicle software platform and cloud-native apps architecture by 2026.

Leverage processes that decouple hardware and software, enable the reuse of software across models and hardware generations, and facilitate the delivery of platform-level updates without full redesigns. Standardize software platforms across diverse vehicles to improve scalability.

TRADITIONAL APPROACH:
SILOED DEVELOPMENT

NEW APPROACH

Many automakers are still working in silos, where teams focus on specific domains like powertrain, infotainment, and Advanced Driver-Assistance Systems (ADAS).

According to surveys by McKinsey and Capgemini Invent, more than 60% of OEMs and tier-one suppliers are organized by component or function, not cross-domain or software capabilities.

As the vehicle development process becomes increasingly more complex, these silos are no longer acceptable.

In SDV development, silos can prevent seamless software integration, cross-domain interactions, system-of-systems engineering, and real-time validation of thousands of parameters. If certain dependencies aren't taken into account, development teams could run into compatibility or safety issues.

Leverage integrated solutions to mitigate silos, streamline cross-functional workflows, and improve overall collaboration.

TRADITIONAL APPROACH:
DEPENDENCE ON LEGACY SYSTEMS

For decades, legacy systems have powered the automotive industry's backbone—from engineering to supply chain and aftersales. But in today's software-centric and rapidly digitizing landscape, this dependence has become a liability. Legacy platforms constrain agility and make it more difficult to adapt to evolving global cybersecurity and regulatory requirements. They often lack the interoperability needed for modern ecosystems—hindering collaboration, slowing time-to-market, preventing scalability, and inflating costs.

According to reports from Statista and PwC, OEMs spend approximately 5–7% of their annual revenue on R&D for legacy models, with the majority spent on mechanical systems and physical prototyping.

NEW APPROACH

Navigate complex development by modernizing IT systems, which enable end-to-end traceability across hardware and software.

NEW APPROACHES IN ACTION

Here's how one global automaker is moving beyond traditional development and implementing innovative approaches.

Optimizing requirement testing and release management was a top priority for the business. But the number of concurrent users in their IT system had outpaced traditional development approaches. The automaker set out to achieve complete traceability with a scalable, enterprise-ready ALM solution. How will your business maximize the value of new development approaches?

The automotive industry has been redefined by accelerating speed and complexity. Traditional approaches designed for mechanical precision and long-term predictability may have built the past, but they can't power the future. Agility, software-centricity, and real-time adaptability define the next era of mobility innovation. As automakers move toward software-first approaches, they must embrace new tools, processes, and mindsets to prioritize flexible, agile development and collaboration between software and hardware teams.

Embracing these new tools is just the beginning. To drive true transformation, automakers must find the right solutions for their business.

The Acceleration Handbook outlines step-by-step guidance for implementing ALM and PLM to navigate complex development, mitigate compliance and cybersecurity risks, and improve efficiency.

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