# Driving the Future: Controlling Operating Costs in an Age of High-Tech Automotive Innovation

Reduce Complexity and Costs, Increase Speed Through Platformization

Global deployment and ongoing management of software code and applications are essential to manage complexity, increase flexibility, and reduce operating cost. Consider deploying a single application (such as navigation or vehicle data collection application) across 10 to 15 vehicle platforms running on diverse operating systems and hardware. The complexity can become unmanageable.
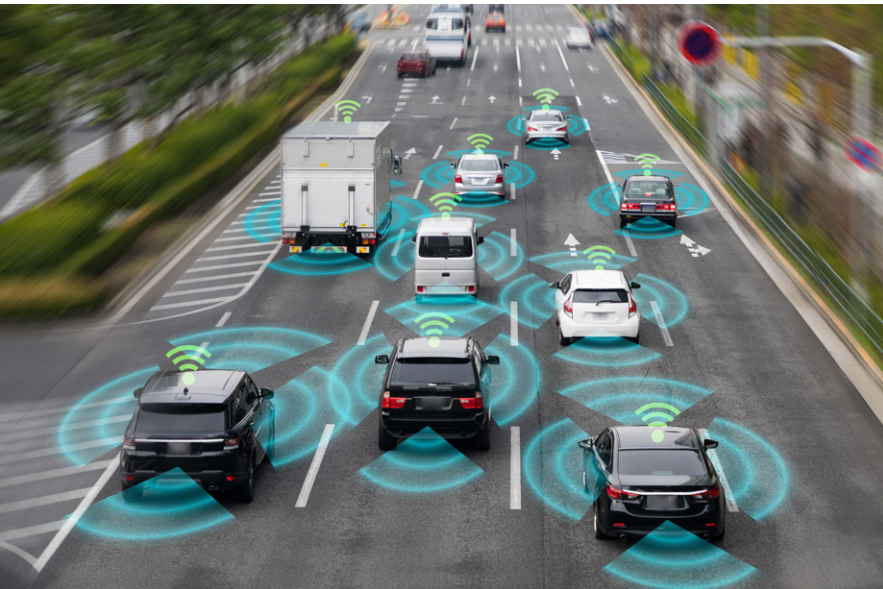
The automotive industry is undergoing a profound transformation with the advent of new technologies and the rise of connected vehicles. As the industry embraces digitalization, the concept of platformization has emerged as a powerful enabler for efficiency gains. Platformization refers to the consolidation of software and hardware components into a unified platform that enables seamless integration, scalability, and improved performance.

Automotive OEMs are focused on transitioning to an EV future, which requires huge investments, while operating their current vehicle platforms. They must balance the need to reduce costs and use the savings to accelerate their investment in this future. Efficient software management from development to operations is becoming key to success. Cost efficient software development frees capacity for investment and keeps the eye on the ball to deliver vehicle-based software innovation without the disruptions normally associated with software deployments.

The best way to manage the complexity and diversity of in-vehicle software is to limit system complexity. Reuse across platforms, computing units, ECUs, domain controllers, vehicle models, and vehicle lines must become the credo of software architecture. The goal must be to keep software operating costs as low as possible while still allowing for innovation, e.g., introducing new advanced driver assistance systems (ADAS) or in-vehicle infotainment (IVI) features to improve the driver and passenger experience. Doing this at scale requires a thoughtful, yet assertive, global approach across the software supply chain.

Increased Efficiency Through Platforms

Platforms enable automakers to develop scalable solutions that can be easily deployed globally across multiple vehicle models and variants. Automakers need to build their businesses on a global platform. The pressure for standardized, efficient mechanisms to achieve this is increasing.

Efficiencies through platformization

Unified integration

Platformization enables the integration of various software and hardware components within the automotive ecosystem. By consolidating different functions into a single platform, automakers can reduce complexity, improve interoperability, and achieve greater efficiencies in resource utilization and system performance.

Scalability and flexibility

A unified platform makes it easier to scale and adapt to evolving industry trends. Platformization enables automakers to add or update functionality without major hardware changes. This flexibility provides shorter time-to-market for new features and the ability to respond quickly to changing customer demands.

Improved data management

As connected vehicles generate massive amounts of data, efficient data management is critical. A unified platform enables streamlined data collection, processing, and analysis. By leveraging a common platform, automakers can gain valuable insights into vehicle performance, customer behavior, and predictive maintenance, leading to improved decision-making and a better customer experience.

A robust software framework makes it easier to add new features or upgrade existing ones, reducing development time and increasing competitiveness. As a result, automakers can achieve cost savings while maintaining the highest quality standards.

aicas' Response to the Challenge

With over 20 years of experience, aicas enables centralized vehicle architectures as the key to openness, extensibility, and scalability that will reduce development costs and further accelerate time-to-market for automakers. aicas' standards-based software architecture enables software to be scaled across all in-vehicle domains and across manufacturers, suppliers, and operators. The solutions include advanced realtime technical capabilities development tools and runtime environments. These tools facilitate the efficient integration of complex software components to ensure reliable, high-performance vehicle operations. aicas' Jamaica products are used in millions of devices and vehicles.

Over-the-Air (OTA) Updates

aicas provides over-the-air (automotive OTA) software management. Modular, incremental updates enable unlimited deployment to millions of devices at any time over the lifetime of a vehicle. Modularity opens the door to faster time-to-market. Scalability to all vehicles on the road is a given. Flexibility across systems, combined with hardware independence, ensures future-proofing for new features—even on the installed base, without the need for dealer visits.

The automotive OEM benefits from lower lifecycle costs and improved monetization, for example, through new feature updates and the ability to offer third-party services and applications.

Unifying In-Vehicle Software Platforms

The unification of in-vehicle software platforms has proven to be a transformative approach. aicas supports all major automotive operating systems and architectures and can support a new platform in short order. By achieving the highest level of portability, software, such as navigation or data application, can be easily transferred to new vehicle models without significant customization. This unification enables the seamless running of the same code on different hardware platforms from different suppliers, reducing the need for extensive customization.

As a result, automakers can streamline development processes, minimize time-to-market, and efficiently introduce software updates and new features across their entire vehicle lineup. The unification of in-vehicle software platforms facilitates the seamless reuse of software components across multiple vehicle lines.

How Customers Benefit From aicas' Solutions

Save time and money...

- ■ **With fast development and rapid prototyping** aicas simplifies development by leveraging realtime Java technology with the Java eco-system and tools, including our million times proven aicas' JamaicaCAR product, giving both customers and developers access to a universe of libraries and automation tools.

- ■ **By focusing on distinctive features** aicas simplifies deployment. By providing the necessary abstraction while preserving the valuable details of each system, aicas enables deployment across heterogeneous systems.

- ■ **By porting and scaling the same software from system to system** aicas enables lift and shift. By taking "write once, run anywhere" to the extreme by bringing Java to embedded and realtime applications, aicas supports a wide range of systems. It empowers developers to write code just once and then deploy it across multiple platforms and operating systems. This portability reduces the development effort and increases efficiency by allowing a single code base to be used across multiple embedded systems.

Platform Use Case: Tier 1 Supplier Infotainment System

A major Tier 1 supplier of in-car infotainment systems needed a software platform able to run a number of search engine mechanisms on a navigation system without interfering with other applications and provide a stutter-free experience for the user. JamaicaVM is used to run the search engine mechanisms for the navigation system and handles task management, thread, and CPU affinity usage for the system. In addition to a stutter-free navigation experience, JamaicaVM has eliminated porting efforts to other hardware platforms on the vendor side, making the system more efficient for them. As a result, millions of vehicles are running this solution today.

Conclusion

In order to free up investment capacity for the future, OEMs must make their current and future vehicle lineups platform-ready today by incorporating the appropriate embedded software. Efficient, while flexible, software distribution frees companies to invest money and time in other areas. aicas offers a highly efficient software management solution that you can deploy globally, minimizing changes.

aicas' expertise in unifying in-vehicle software platforms plays a critical role in driving the platformization of the automotive industry. Through scalable solutions, reduced complexity, and seamless integration, aicas helps automotive OEMs meet the evolving demands of the software-defined vehicle era, ultimately improving the customer experience and their ability to compete in the marketplace.