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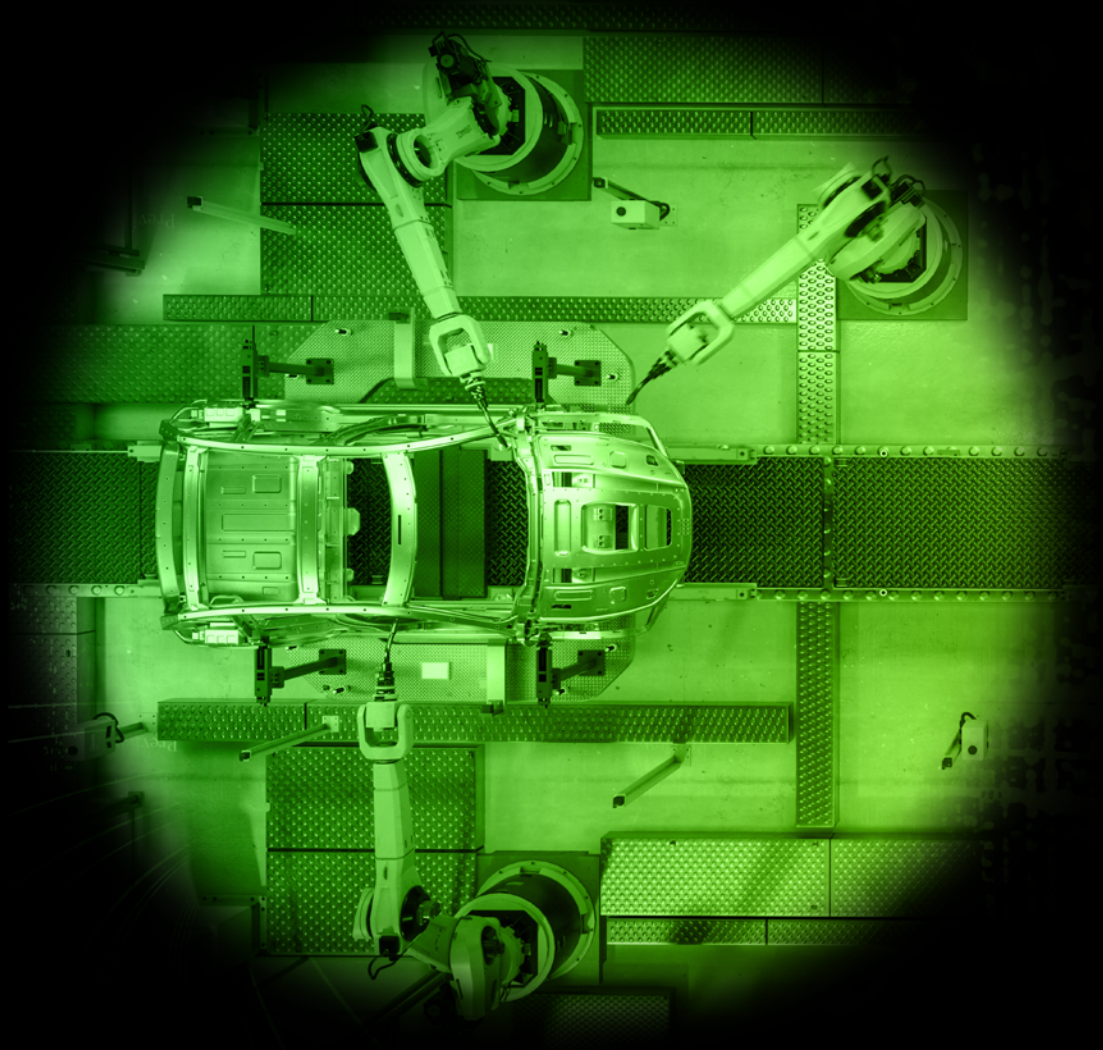


EngineeringBeat: Thriving with mainframe modernization

Achieving digital transformation success in the automotive manufacturing industry

The automotive manufacturing sector is changing rapidly, compelled by the need to digitally transform to meet evolving customer and stakeholder expectations. Buyers are increasingly demanding efficient, digital, personalized buying and ownership experiences—from online purchasing to in-car subscriptions. Also, vehicle software and technology features are becoming increasingly more important to consumers than traditional specifications such as engine size. Automakers also face increasing pressures to improve supply chains and innovate with new financing models that grow the bottom line and increase shareholder value. However, many automakers still rely on legacy mainframe technology to meet this checklist of modern needs.

These aging legacy systems contain siloed customer, dealer and vehicle data. They also can't effectively support access to modern technologies and AI-driven analytics that support quicker decision-making and deeper insights into the business and customer. Further, outmoded order management and supply chain systems can struggle with customization demands, while captive finance platforms aren't agile enough to engage in direct lending activities and emerging trends such as short-term leases.

Mainframe modernization can help. Advanced cloud-based technology ecosystems make it easier to access data for real-time decision-making, data-driven automation and scalable operations. Automakers can also provide more tailored customer experiences, optimize supply chains and innovate financially. By embracing modernization, they can transform into data-driven, agile enterprises that have the ability to accelerate the innovation that drives growth.

Challenges in the modernization journey and strategies to overcome them

There are critical challenges driving modernization that should be addressed quickly to realize value, and there will also be obstacles during actual modernization that can derail the process. All these challenges can be overcome with a combination of technology and change management to keep the initiative on track, and on budget.

Challenges that drive the modernization initiative

In a rapidly evolving environment, there are challenges automakers face that stand out as being most critical to long-term innovation and growth. Mainframe modernization can provide the capabilities to help manufacturers overcome them.

1 Customers demand more personalized experiences. Provide them with modern analytics and connected vehicle features.

Automakers need the ability to offer more personalized online buying experiences and integrate with on-vehicle features. They also want to interact with customers through multiple channels like mobile apps, tailored campaigns, service programs and subscriptions. However, automakers' traditional, mainframe-based and large customer, dealer and vehicle datasets can't easily facilitate using the modern technologies necessary to meet their goals.

Migrating to cloud can help auto manufacturers meet their goals. Cloud-based advanced technology platforms support the ability for automakers to centralize customer, dealer and vehicle data and make it more easily accessible. Implementing connected edge technologies also enhances automakers' abilities to collect data in real time for more personalized experiences and proactive service notifications for consumers. Edge capabilities also enable seamless updates and management of in-vehicle subscriptions—all of which enhances the customer experience.

2 Supply chains need to be modernized. Accomplish that with real-time data and scalability.

Mainframe-based order management and supply chain systems cannot adequately handle the increased customization options, diversified supply chain infrastructures, and vehicle scheduling requirements automakers need to leverage modern purchase channels. The result is often bogged-down supply chains and slow response to market and economic fluctuations.

Migrating to cloud can help automakers modernize their supply chains to better manage an increasingly volatile global trade environment. For example, with cloud's scalability, manufacturers can more effectively manage customization demands and operate more diverse supply chains. These capabilities enable automakers to more quickly adapt to modern purchase channels.

> Real-time data analysis capabilities can improve manufacturing processes and schedules via more up-to-date information

3 Automakers need to be able to support emerging finance products. Enable that with cloud-based integration.

Mainframe-based captive finance systems cannot easily support today's emerging finance capabilities such as engaging in direct lending to customers, meeting enhanced fleet financing requirements, and providing and managing vehicle feature subscriptions. As a result, automakers have limited flexibility to support new financing models. To provide these capabilities, manufacturers need more seamless integration with noncaptive services.

Mainframe modernization provides the ability to use application programming interfaces (APIs) and real-time data integration capabilities for more efficient noncaptive services connectivity. The flexibility and scalability inherent in cloud-based architectures can also enable automakers to adapt more quickly to emerging finance products, requirements and regulations.

4 Just-in-time (JIT) manufacturing capabilities are essential. Support them with microservices and ERP extensions.

For many automotive manufacturers, inventory management is run on legacy application and code—systems that only support static batch processing, rather than dynamic, demand-driven management JIT manufacturing requires. Consequently, there is limited real-time visibility into inventory, which can lead to issues with shortages, overstocking or inefficiencies.

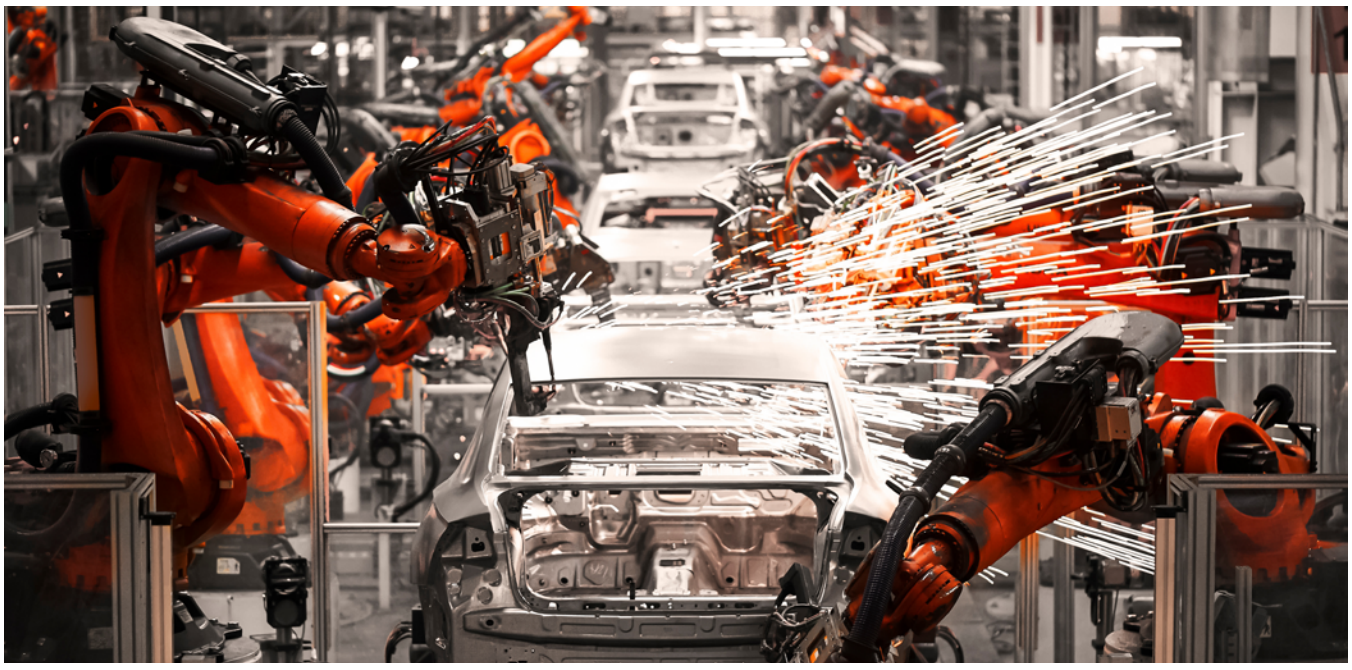
A cloud environment supports the use of microservices and cloud-enabled enterprise resource planning (ERP) enhancements to transform batch-processing inventory systems into more dynamic platforms. These platforms can enable manufacturers to effectively meet their inventory management needs, via providing real-time data for improved visibility into—and analysis of—their inventory levels. For example, critical COBOL functions can be containerized and exposed via APIs, and automakers can integrate real-time IoT sensor data from assembly lines, warehouses and suppliers to make stock updates, replenishment and scheduling more effective.

5 Software-defined vehicles are a key driver of customer engagement. Support them with cloud-based platforms.

Today's vehicles contain much more technology—making them more dependent on software features than ever. Most vehicles are continuously connected to external networks for information, data sharing, and software updates. However, software-defined vehicles cannot effectively use mainframe systems on the backend due to their needs for real-time processing capabilities, scalability, flexibility, connectivity and low latency.

Cloud offers seamless network connectivity and continuous software updates, and it enables efficient data sharing between vehicles and networks—all of which helps vehicles have the latest technology and stay responsive to real-time demands.

> Cloud-based platforms can help meet the various needs that software-defined vehicles require.



Challenges during the modernization initiative

To be sure, mainframe modernization can solve many business issues that impede innovation and growth. However, modernization also comes with challenges of its own that must be managed effectively to achieve the desired outcomes.

1 Securing and sustaining funding can be challenging. Solve it with gradual implementation and clear metrics.

Cloud migration initiatives can have high initial costs, which could jeopardize funding. For example, migrating complex auto financing systems can require significant investments. It can also be costly to understand and migrate from deeply entrenched manufacturing mainframe systems. Finally, it may be difficult to quantify modernization benefits in an automotive market that's in constant flux. Funding issues can significantly delay the modernization effort, thus stifling innovation and possibly decreasing competitive advantage.

To overcome this challenge, it's essential to have a holistic modernization plan that follows a phased approach with achievable milestones. It's also crucial to clearly define what success looks like with specific return-on-investment metrics that truly measure value and delineate any cost savings. It's also necessary to gain and keep executive commitment with regular, frequent and open communication about challenges and benefits so that problems can be solved before they become widespread.

2 Obtaining secure, high-speed data exchange is critical. Leverage AI-driven pipelines and intelligent data mapping to achieve this.

Mainframe product life cycle management (PLM) systems often store critical design models and specifications, and engineering change orders and results. However, these mainframe systems often cannot support the use of modern, cloud-based engineering tools, which can hobble collaboration between design and manufacturing teams, as well as between automakers and suppliers.

Migrating to cloud-based platforms can help by providing the ability to leverage AI-driven pipelines for secure exchange of PLM data. Intelligent data mapping can also help ensure compatibility between mainframe and modern systems to preserve system functionality throughout the modernization initiative. As a result, design processes are improved via enhanced collaboration between teams, which significantly accelerates time to market for new vehicles.

Mainframe modernization in action—a potential use case

Here's a look at how an automaker could undertake a pilot project to assess the potential value of using Generative AI (GenAI) to assist in modernizing its mainframe and other legacy codebases:

A global automaker wants to evaluate the potential of using GenAI to streamline and improve its software development processes. Its plan is to undertake a proof-of-concept project on one information system to explore the capabilities of GenAI in documenting, assessing and modernizing the system's existing codebase.

The first step would be an assessment phase that would focus on application metrics, business rules, network information and code complexity. Next, a planning phase would consist of decomposing the system into microservices, mapping any dependencies, and performing functional-equivalence testing. Finally, an implementation and testing phase would include actually converting legacy code to Java, generating test scenarios and implementing automated testing.

The potential impact could be significant. By extrapolating the results of the pilot project to the enterprise, the automaker could expect GenAI capabilities to enable substantial time savings. By Deloitte's estimation, GenAI could potentially accelerate the mainframe modernization life cycle by 50% or more—which could lead to a considerable reduction in total cost of ownership, improved code quality, and enhanced agility in responding to evolving customer demands and shifts in an increasingly volatile market.

The modernization payoff

We've discussed the business challenges that are driving automakers to modernize and the obstacles that must be surmounted to successfully meet the challenges. Overcoming those obstacles can provide potential benefits such as:

Improved supply chains: With more access to real-time data and AI-driven analytics, automakers improve supply chain visibility to optimize inventory management and streamline logistics operations.

Enhanced ability to leverage modern technologies: Modernized systems enable automakers to leverage modern technologies like IoT, big data analytics and AI, to automate manual processes, improve the customer experience, and analyze data from across the enterprise to uncover opportunities for innovation and growth.

Increased agility and innovation: With the access to quality, real-time data and scalability options that cloud-based infrastructures provide, auto manufacturers can increase their agility and ability to innovate—which can result in a healthier bottom line and increased market share.

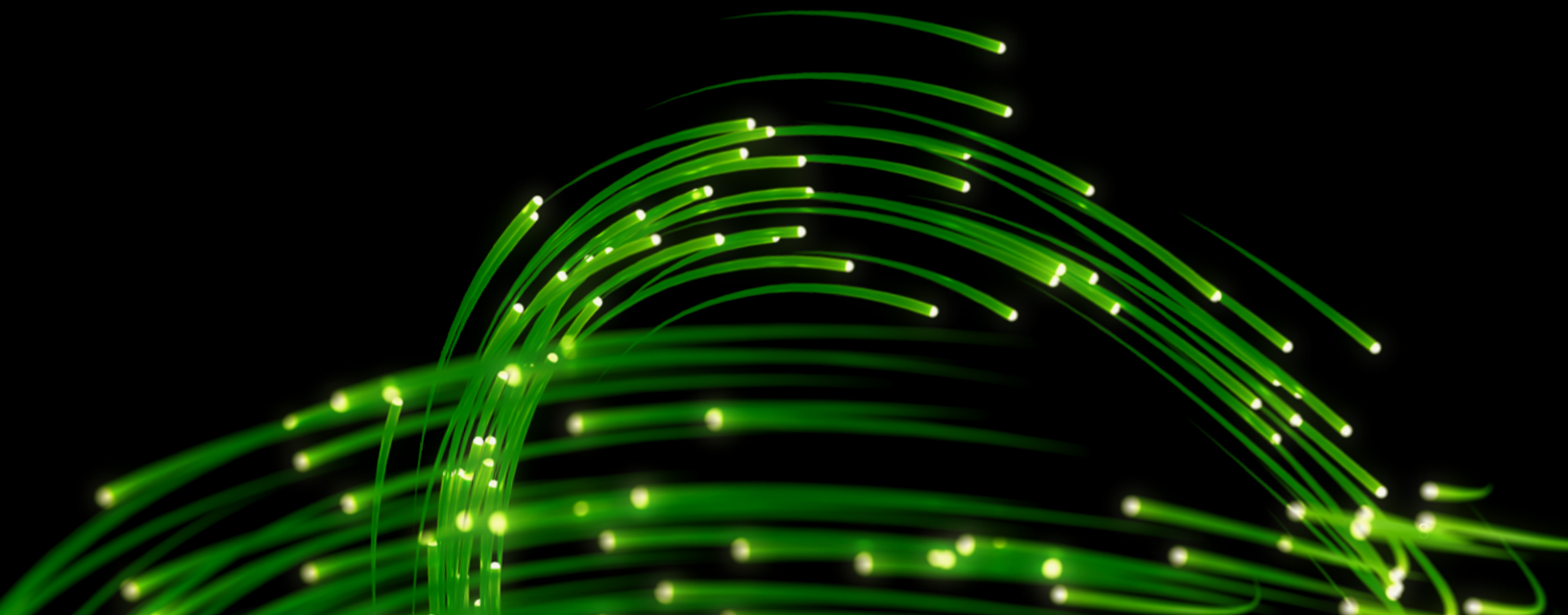
Strengthened competitive edge: By embracing digital technologies and modernizing their IT infrastructure, automotive companies can enhance their competitiveness in a rapidly shifting, increasingly global market landscape.

The road ahead

Mainframe modernization is essential to enable digital transformation in the automotive industry. And it's a critical issue for most automakers. In fact, based on internal research conducted by Deloitte, it is estimated that roughly 75% of automotive industry clients still have a mainframe footprint. By migrating to more advanced technology platforms on cloud, automakers can gain the agility and ability to innovate that's needed to sustain their competitive advantage and drive lasting business value.

First, automakers can improve access to their data to optimize supply chains and support innovative financing models. Second, they can elevate their clients' experiences by enhancing customer-facing systems and processes to provide more customized offers, improve usability of online sales platforms, and finally, automate personalized service scheduling systems.

The journey won't be easy, and there will be challenges with technology and funding along the way, but the outcome—enduring business value and competitive advantage—will be well worth it.



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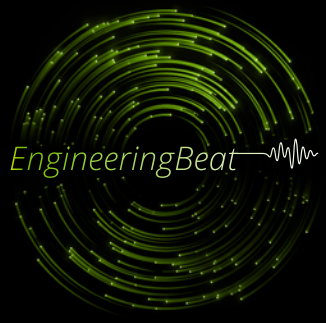

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