Middleware solutions for the automotive industry
Executive brief

Innovate automotive design, production and supply chain to get to market quickly and reach new markets.

Middleware is Everywhere | Can you see it?

Contents

Executive summary

At the same time that automotive companies like yours face the pressure to meet customer demands with rapid, regular improvements, a number of challenges stand in the way. Supplier integration and collaboration complexity increases. Retail and aftermarket costs rise. The costs and demands of global regulations increase.

An on demand operating environment can help you address these challenges. By leveraging information across your business, you can optimize business processes, and identify and implement new revenue-generating initiatives. Tools that help you manage design and production processes also enable you to get to market rapidly. And when you integrate your supplier community — from requirements definition through design and development to aftermarket — you can drive innovation, satisfying both needs for high quality and regulatory compliance.

Leveraging IBM's extensive experience with leading automotive companies, IBM Middleware Solutions for Automotive help you manage today's industry challenges and support the development of your on demand business. This executive brief introduces these middleware solutions and highlights how IBM can help your automotive company:

- *Optimize design, development and manufacturing within your enterprise and with your suppliers.*
- *Drive customer satisfaction and loyalty through dealers.*
- *Minimize both costs and the complexity of business management.*

Manage across an increasingly complex supply chain to meet customer demands

Every year, automotive manufacturers need to create new models to meet increasing customer demands. Car architectures increase in complexity to meet customer demands. That means that in addition to Original Equipment Manufacturers (OEMs), mechanical and electronic system and component suppliers must design and produce at an accelerating pace. And do so without sacrificing quality or cost — to gain today's customer loyalty.

Consequently, automotive companies are changing the ways they work together to create designs, build products and efficiently integrate mechanical and electronic design. Computer simulations are used rather than physical models to test safety, efficiency and performance. By using digital design and simulation software, automotive design cycles can be reduced from 72 months to as short as 18 months with a lower cost structure.

Faced with highly demanding consumers and compressed development cycles, establishing reliability throughout the global supply chain is crucial. Every automotive company must get the required assembly, part or material necessary in time to meet demands. Manufacturers who establish high-quality design, development and production processes help avoid costly repairs and recalls that can plague competitors.

"We needed to access and view accurate, up-to-date information from different areas of the business. An enterprise data warehouse based on DB2 software from IBM was ideal for fulfilling our reporting and analysis requirements."

— George Mortis, Manager of Data Resource Management, Information Technology Management, DaimlerChrysler Corporation

When quality issues occur, effective analysis and problem management become crucial to satisfy affected customers. The increasingly costly requirements of global regulations require companies to track where parts go, comply with standard reporting, and collect and correlate customer and warranty data.

Across design, development, production and aftermarket processes, the effective use of information technology (IT) is crucial. IT solutions help automotive companies maximize revenue by bringing new products to market quickly and minimize costs by optimizing design, production, supply chain, retail and aftermarket sales and service processes.

Establish an on demand operating environment to integrate resources and manage design and production

IBM can help automotive customers meet today's industry challenges. To help you rapidly tap new markets and manage complexity across the supply chain, IBM provides solutions to create an on demand operating environment. An on demand operating environment integrates people, processes and information while simplifying IT infrastructure management. Among its key characteristics, an on demand operating environment:

- *Uses technology as an open framework to help build the flexibility, responsiveness and efficiency that your on demand business requires.*
- *Tightly integrates business processes end to end.*
- *Reuses modular components to drive efficiency.*
- *Connects components using industry-specific open standards.*

An on demand operating environment can help you connect disparate resources into a seamless, flexible and responsive organization.

IBM's on demand operating environment enables you to:

- *Leverage information across your business.*
- *Manage the design and production processes.*
- *Integrate the supply chain.*
- *Respond quickly to shifts in market demand.*

IBM is a leader in open standards including:

- IT standards such as Java™ 2 Enterprise Edition (J2EE), Web Services and Linux®.
- Industry standards such as the Automotive Industry Action Group (AIAG) and Standards for Technology in Automotive Retail (STAR).

Leverage information across your business to facilitate revenue-generating initiatives

Responding to customer demands and driving customer satisfaction are easy to talk about but difficult to achieve when information is scattered in many disparate systems throughout your infrastructure. Integrating data access across your disparate systems — structured and unstructured, static and real time, manufacturers and suppliers — is a crucial step in better understanding your customers and your business processes.

Leveraging information across your business enables you to:

- *Overcome current difficulties in obtaining customer feedback that hamper customer loyalty and blunt competitive advantage.*
- *Implement flexible development and production processes to build your innovative designs precisely, rapidly and cost-effectively.*
- *Deliver personalized information and processes that drive employee productivity and improve customer satisfaction.*
- *Proactively monitor the performance of Customer Relationship Management (CRM), design, manufacturing, supply chain processes and warranty.*
- *Dynamically change processes to respond to changing customer demands and minimized cycle times.*

Manage design, development and manufacturing processes to enable you to get to market quickly

To overcome the gap between the emerging need for shorter development cycles and cumbersome processes, leading automotive companies seek to streamline their critical business processes. Providing people in design and development the role-appropriate information they need is very important. But a robust solution also includes tools that facilitate reuse of both designs and knowledge. Furthermore, automotive companies benefit from monitoring and management solutions that measure the transformed design and development processes and help identify future opportunities to optimize these processes.

When you efficiently manage the design and production processes, you can:

- *Share design information between engineering teams – across original OEMs and suppliers – to facilitate collaboration and decision making and drive rapid time to market.*

- *Reuse existing designs and knowledge to help accelerate time to value.*
- *Manage the development process across in-vehicle domains, care platforms and vehicle suppliers to help maximize production capacity, reuse and flexibility.*
- *Use a common business production portal to monitor production status, manage process exceptions and enable timely issue resolution.*

"IBM WebSphere software helps Audi foster management efficiencies and powerful customer relationships."

— Thorsten Kuehl, Senior Technical Consultant, divine GmbH

Integrate supply chain through aftermarket to drive quality and help comply with regulations

The business relationships that make up your supply chain have never been more important to your success — or more complex to manage. Transactions between you and your partners, suppliers and OEMs need to become highly integrated to support your goal of getting to market quickly. At the same time, to help avoid recalls and help comply with regulations, you need to verify the quality of incoming components and products and track where your outgoing components and products go.

To achieve these goals, you need a comprehensive solution for integrating your supplier community. One that can help you manage many facets of your relationships — from monitoring the data you share to building collaborative virtual work environments to automating applications that span multiple companies.

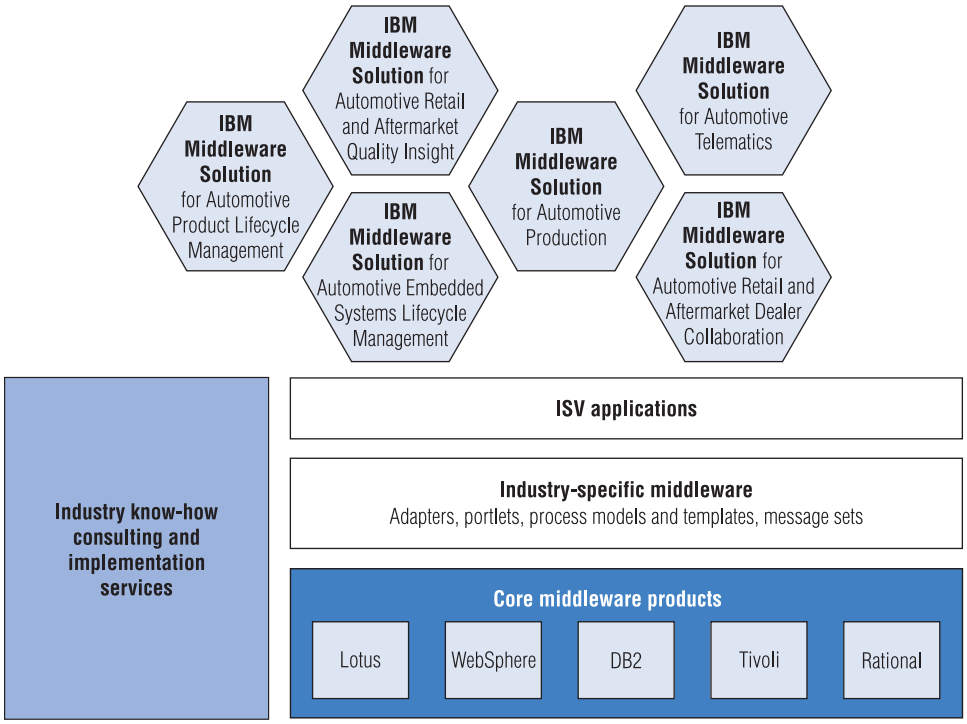
Integrating the supply chain helps you:

- *Implement effective outsourcing and design models for production to optimize inventory and manage relationships with partners, suppliers and OEMs.*
- *Integrate applications and data between Product Lifecycle Management (PLM), Enterprise Resource Planning (ERP) and Manufacturing Execution Systems (MES) applications.*
- *Create highly secure, standards-based development, engineering and manufacturing environments that span internal, outsourced, dealer and customer communities.*
- *Optimize build-to-order capabilities to increase customer satisfaction, minimize in-house and vendor-managed inventory, and maximize resource utilization and flexibility in the supply chain.*
- *Help avoid mistakes due to manual procedures – both internal processes and those that involve dealers and other aftermarket partners.*

IBM provides solutions for automotive manufacturers and suppliers

To support on demand operating environments for automotive industry companies and help meet today's automotive industry challenges, IBM has developed industry-specific

middleware solutions. IBM Middleware Solutions are customized combinations of IBM core middleware and industry-specific middleware that, when combined with application software from IBM's network of independent software vendor partners and industry-specific services, enable customers to build an on demand operating environment.



Overview of a middleware solution

Each IBM Middleware Solution for Automotive enables you to drive business improvements. Together, these solutions help you optimize your value chain.

IBM Middleware Solution for Automotive Product Lifecycle Management

Because this integrated platform and application suite is designed to facilitate rapid development and collaboration across and beyond company boundaries, the solution helps you:

- *Manage and enable timely access to PLM intellectual property data – for employees and suppliers to create the best vehicles for demanding customers.*
- *Optimize the PLM development processes by digitally creating, managing and simulating the vehicle rather than building costly, time-consuming physical prototypes.*
- *Extend participation in the product development process across procurement, manufacturing, maintenance and marketing teams.*
- *Facilitate design reuse across models and platforms.*

IBM Middleware Solution for Automotive Embedded Systems Lifecycle Management

When you implement the open-standards–based, best-practice processes of these systems engineering and software development tools and methodologies, you can:

- *Manage the increased complexity of vehicle development caused by the increasing number of software and electronics components in cars.*
- *Facilitate quality development and enable innovation.*
- *Help maximize productivity and minimize errors to meet customer expectations and minimize the risk of bringing new products to market.*

"We've created an entirely new sales channel for our company by using IBM technology. As a result, our customer base has grown substantially."

— Robert Ernst, IT Manager, Mike Castrucci Chevrolet

IBM Middleware Solution for Automotive Production

This comprehensive integration solution uses a manufacturing model designed to manage costs, process efficiencies and provide quality control. By implementing this integration solution, you can:

- *Leverage existing production resources and up-to-date information to drive optimal utilization of manufacturing capacity and integrate with enterprise systems.*
- *Simultaneously drive operational efficiencies and quality.*
- *Use real-time information to provide visibility into production data, thereby enabling production facilities to dynamically and flexibly respond to customer demands.*

IBM Middleware Solution for Automotive Retail and Aftermarket Dealer Collaboration

This solution helps extend enterprise collaboration by linking manufacturer systems directly to dealers and channel partners for parts and accessories throughout the post-sales demand chain, helping you:

- *Facilitate and support dealer interactions to improve the customer experience of buying and owning an automobile.*
- *Speed new model launch programs.*
- *Capture and execute best practices that help streamline sales and minimize the costs of accessing the correct information, delivery and execution processes.*
- *Enhance dealer interactions through customized communications while improving efficiency and service quality.*

*According to SEC filings, North American automotive manufacturers reported over $11 billion warranty claims in 2003.**

IBM Middleware Solution for Automotive Retail and Aftermarket Quality Insight

This solution provides a set of comprehensive product performance data analysis and performance monitoring and reporting capabilities that enable you to access underused data and facilitate collaborative decision making. With the solution, you can:

- *Detect problems in product quality rapidly by analyzing available data sources.*
- *Automate early-warning business processes to help minimize warranty cost and maximize product design, production quality and safety standards*
- *Enable reporting in compliance with government regulations, such as the United States Transportation Recall Enhancement, Accountability and Documentation (TREAD) Act.*

IBM Middleware Solution for Automotive Telematics

Telematics is increasingly becoming more important in the automotive industry, moving from being a differentiator to becoming an essential service. Integrated hardware and software in automotive vehicles enable multimedia content services including emergency rescue, remote stolen-vehicle tracking, real-time traffic information and personalized services such as news, weather and stock updates. Telematics offers real-time insight on how vehicles are performing and provides drivers with assistance before problems arise. With this solution, you can:

- *Effectively manage increasing vehicle complexity by connecting directly with vehicles.*
- *Enable remote diagnostics, prognostics and software updates to drive customer satisfaction and product differentiation and improve warranty service.*
- *Communicate efficiently from vehicles to customers, suppliers and service teams.*

For more information

To learn more about IBM Middleware Solutions for Automotive and how IBM can help you manage escalating costs and support rapid development and production, call your sales representative or visit **ibm.com**/software/industries/auto

IBM Corporation
Software Group
Route 100
Somers, NY 10589
U.S.A.

Printed in the United States of America
07-04

**Warranty Week* Fourth Quarter Report, March 30, 2004.

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G507-1364-00