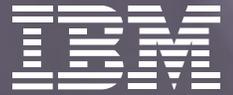


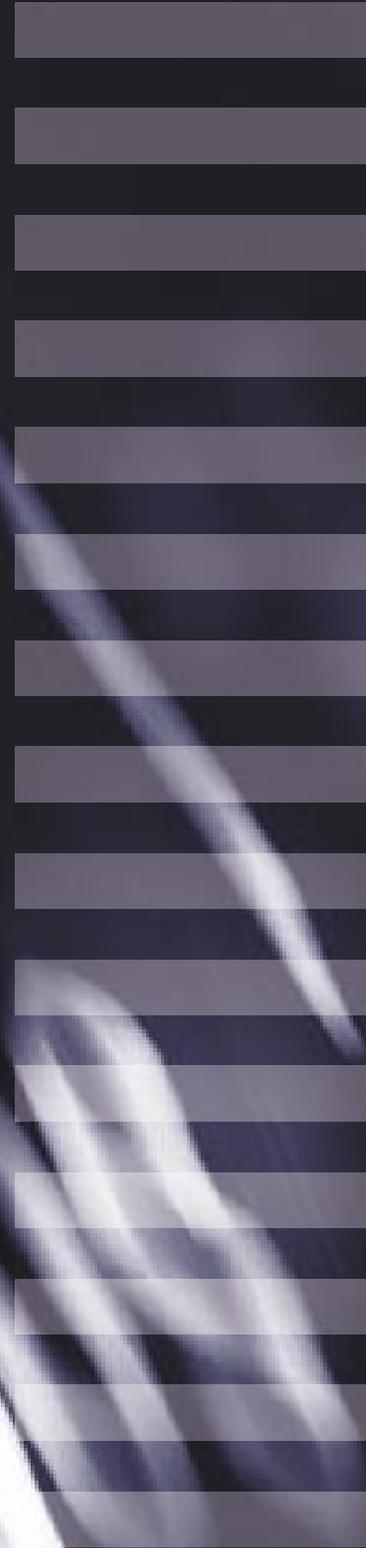
IBM Business Consulting Services



# Helping automotive companies innovate and gain competitive advantage with Product Lifecycle Management

IBM Automotive PLM Solutions

Automotive  
Industry





### ***Keeping pace with competitive pressure***

Today's automotive companies face considerable pressures. Executive management is seeking both growth and cost reductions to make their companies more competitive and profitable. At the same time, the industry is changing. An increasing number of vehicle models are being introduced to more dynamically segmented markets; more new models are being launched per year than ever before. Vehicles themselves are becoming more complex to be able to satisfy consumer demands for improvements in safety, fuel economy, performance and quality.

To meet these pressures and to differentiate from the competition, a focus on innovation and new capabilities is required to achieve product and process improvements. According to some analyst projections, 90 percent of all future innovations in automotive vehicles will be electronics-related and 80 percent will be derived from software, which increases the complexity of product development and leads to greater warranty considerations<sup>1</sup>.

### ***The automotive industry faces complexities***

Managing the automotive product lifecycle is a complex task because of both the growing electronic content in vehicles and the sophisticated IT systems required to support the product development process itself. Electronics, electrical systems and software are becoming more

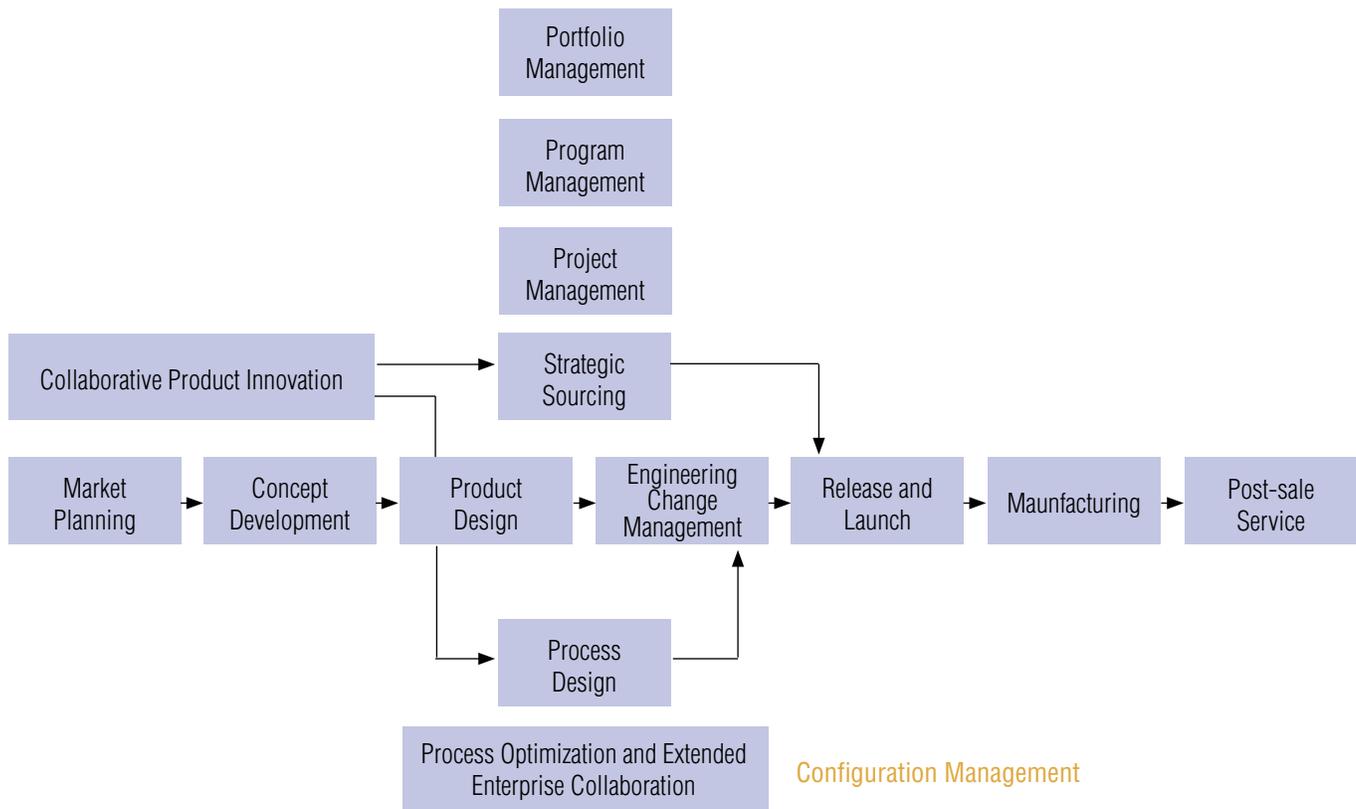
integral to development. Automotive IT systems encompass disparate systems, huge volumes of data in various formats, and hundreds of applications used around the clock by employees located throughout the world.

Pressures are forcing a fundamental change in the way in which automotive companies do business. The changes will address structures and business models, and will challenge the automotive industry to transform into collaborative communities that extend beyond traditional company boundaries.

Over the last decade, brand owners have increased the amount of work outsourced to their supply chains. Some brand owners are already planning for the day when they no longer directly manufacture vehicles. A significant portion of automotive value creation is moving from the brand owners to vehicle integrators and suppliers and it is expected that more than 75 percent of a vehicle's value will be created by the automotive supply chain by the year 2015<sup>2</sup>. Eventually, the entire vehicle design and development process will become a collaborative effort between global enterprises operating in diverse environments.

It is vital to have efficient processes and tools in place for design, testing, analysis, validation and certification in order to help ensure that products are not only safe, but feasible and profitable. And, the need for close partnerships and integration with suppliers becomes critical.

## What is within scope of Product Lifecycle Management?



### *Faster time to market with lower development costs*

Product Lifecycle Management (PLM) solutions enable companies to turn their innovation power into profit, by addressing issues related to increased product individualization, successful launches, time-to-market demands, product quality, program management, and risk management practices.

IBM Product Lifecycle Management solutions offer methods to speed engineering and product development processes and to get to market faster while reducing costs. Our solutions provide an integrated set of methodologies, software, tools and services to address business require-

ments associated with automotive product planning, concept development, design, engineering, analysis, testing, launch and support. Solution benefits may include:

- Improved environment fostering innovation and creativity
- Improved processes
- Increased productivity in both design and manufacturing
- Reduced time to market
- Reduced new product introduction resource needs
- Reduced dependency on physical prototypes by using simulation and analysis tools.
- Efficient collaboration in heterogeneous environments

IBM Product Lifecycle Management offerings range from application software and solutions surrounding mechanical design to entire systems engineering, as well as embedded systems and software lifecycle management solutions that address the complexities of today's vehicles.

### **Improved mechanical design and productivity**

IBM mechanical design solutions enable shared business processes and product knowledge, helping you to create more personalized vehicles in shorter development times. With our mechanical design solutions you can:

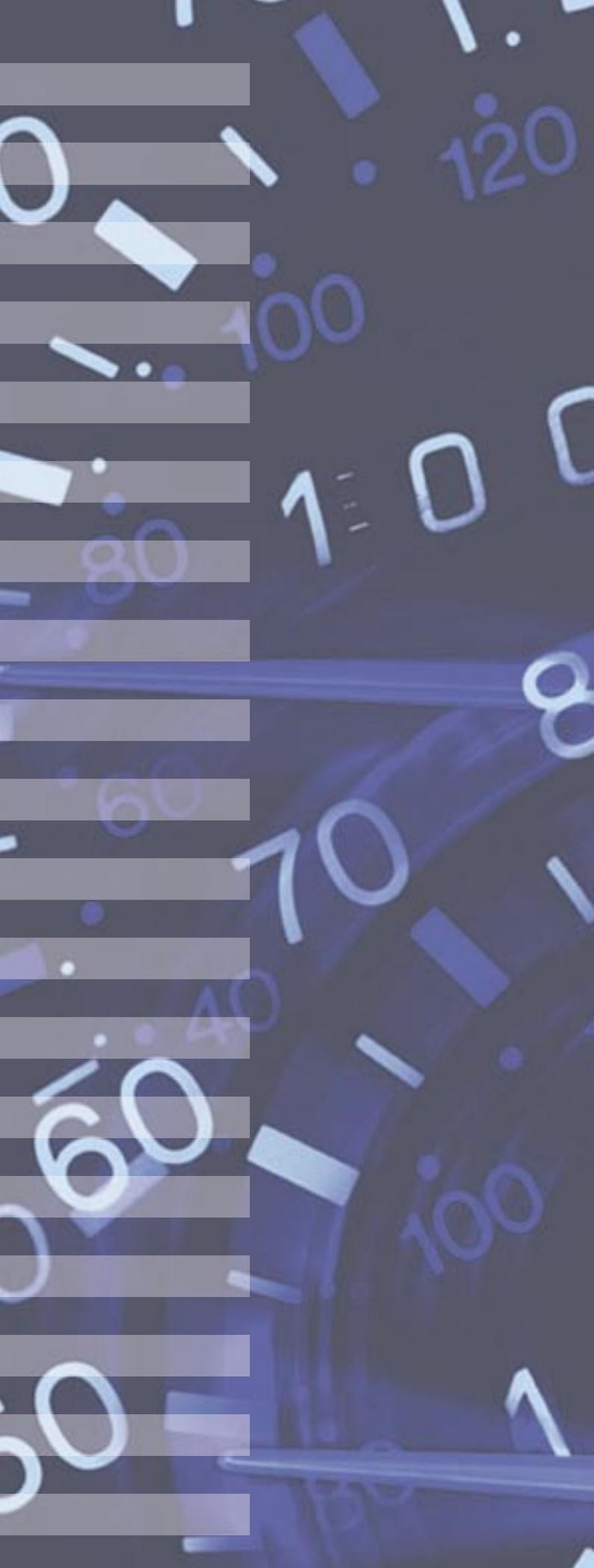
- Automate repetitive design tasks
- Improve your design productivity by using predefined templates that capture and reuse existing design knowledge
- Deliver time, cost and quality breakthroughs through the relational product development approach that manages relationships at the design feature level across parts, assemblies and configurations
- Improve decision making by building, understanding and managing the "cause and effect" relationship of product development throughout the product lifecycle
- Increase collaboration capabilities between design, simulation and manufacturing departments
- Enable teaming between all parties involved in conceptualizing, designing, building and supporting products

### **Innovative engineering**

Increasing product design innovation and quality while decreasing development cycle time might seem impossible. Minimizing delays between design and simulation, increasing efficiency in performing iterative analysis and improving data management become possible with a set of IBM Engineering Innovation Framework solutions. More analysis in less time helps you increase quality and profitability, and faster respond to your customers.

Working with leading automotive simulation and analysis application providers, IBM is enabling the automation and integration of iterative design and analysis processes with the help of optimized IT infrastructures. IBM Engineering Innovation Framework solutions cover the product performance simulation space within PLM:

- Computer aided engineering (CAE)
- Simulation and analysis of product performance (crash, durability, thermal dynamics and fluid dynamics)
- Manufacturing and assembly simulation (formability, ergonomics, fitting and quality)
- Manufacturing process, engineering, operator logistics and financial simulation



High performance computing has been used by automotive companies for years to analyze and simulate product performance. The IBM Engineering Innovation Framework was designed to help reduce the need for physical prototypes and tests by reducing hardware costs and using sophisticated simulation software from software providers. Also, IBM Deep Computing Capacity on Demand offers the flexibility for clients to request the compute capacity whenever they need it.

Benefits of the IBM Engineering Innovation Framework solution may include:

- More iterations possible in a given time, leading to increased product quality
- Reduction of product development expense by decreasing dependency on physical prototyping and testing through using electronic simulation
- Improvements in knowledge reuse through product and simulation data management

*Volvo needed to maintain its well-known, high safety standards for its vehicles by allowing design engineers to collaborate worldwide. Using an IBM supercomputing environment, Volvo engineers are able to share vast computing power from multiple sites to perform critical automobile crash simulations that result in the design of safer cars.*

### **Embedded systems lifecycle management**

Most automotive innovations will be software-related and automotive companies that excel in this area will have a greater opportunity for success. But, how do you make a profit when the vehicles your customers want contain more and more electronics and software content and are becoming ever more complex to manage and maintain?

Embedded Systems Lifecycle Management solutions from IBM combine applications, infrastructure, services and consulting to enable the strategy, design and support of in-vehicle software and electronics. Using an integrated set of systems, tools and services that map software development to your changing requirements, we'll help with your most critical automotive lifecycle initiatives. In addition, automotive software development centers can leverage the help and expertise of IBM's Engineering and Technology Services and our labs.

IBM Embedded Systems and Lifecycle Management solutions can help you manage the cost of innovation through the development of embedded software in a lean, responsive digital modeling environment and by applying emerging standards that increase the ability to reuse software and reduce failures and unplanned system interactions.

*IBM and Valeo, one of the world's leading automotive suppliers, launched a cooperative initiative to expand automotive embedded software capabilities. As part of the partnership, Valeo is providing automotive expertise and IBM is providing process and methodology support in embedded software. This joint initiative is designed to achieve high-quality, cost-optimized and best-in-class reliability and safety of automotive software.*

Benefits of IBM Embedded Systems Lifecycle Management solutions may include:

- Ability to manage software during the entire vehicle lifecycle
- Reduced warranty issues and improves integration through better systems design
- Accelerated time to market and time to value
- Increased agility and collaboration throughout the product development process

## **Supplier collaboration**

Design and development functions in OEMs and suppliers alike need to align to be able to faster respond to rapidly changing requirements. IBM supplier collaboration solutions help increase innovation, improve resource utilization, and shorten product development cycles. IBM can help automotive suppliers become more competitive by working seamlessly and simultaneously together with the OEM to develop complex vehicles that conform to customer and industry quality standards.

In addition, IBM supplier collaboration services support integration along the entire value chain with infrastructure, tools, methods and processes and enable cost-effective implementation of utilization models with innovative technology.

IBM supports supplier collaboration with Web based services that provide rapid and reliable support using up-to-date configurations and information relevant for deployment and operation. Other examples are newsletters, help desk and product downloads.

With IBM solutions for supplier collaboration you can:

- Avoid redundant IT and engineering costs in the maintenance and operation of OEM interfaces
- Increase flexibility, quality and performance through modern methods
- Standardize your product lifecycle management interfaces internally and with partners
- Create efficiency and security when working with partners by applying transparent processes with maximum automation and validation

## ***Providing a comprehensive portfolio of automotive solutions and services***

IBM Product Lifecycle Management solutions include the integration with your existing environment to protect your legacy IT investments. At IBM we can pull from a wide range of cross-portfolio IBM products and services to complete your automotive solution.

## **IBM Automotive Product Lifecycle Management solutions enable innovation**

As a recognized leader in both, the technology industry and the automotive industry, and as a user of our own product lifecycle management solutions, IBM has a unique experience in product design, development and management.

- Innovation is a discipline that requires a supporting culture, as well as the tools, processes and infrastructure necessary to achieve it.
- Product lifecycle management is more than a design application; it is a way to improve your business.
- Success depends on building your business on a strong foundation that is open and scalable and that can flexibly respond to change and support the integration of disparate systems.

## **IBM systems and storage**

IBM can deliver a full range of leading-edge technology and hardware products to meet your needs. IBM offers Systems, workstations, printers, storage, semiconductor hardware, middleware and services designed to work together with associated software forming the best possible platform for business applications.

Built on open standards and designed to integrate with existing and future IT infrastructures, IBM Systems include proven technologies for collaborative innovation, openness and virtualization. IBM Systems can provide building blocks of simpler, more integrated infrastructures that can power innovation while helping you protect your current investments and dramatically improve the economics of IT.

Key offerings used by IBM Product Lifecycle Management solutions include IBM's UNIX, Linux and Intel-processor based systems, IBM BladeCenter® systems, IBM high-performance clusters, IBM IntelliStation® workstations, IBM System Storage® solutions, IBM Virtualization Engine™ and IBM Grid Toolbox. In addition, automotive-industry experts from IBM Engineering and Technology Services can assist with everything from systems or chip design and deployment to hardware customization.

## **IBM software**

Our open-standards-based middleware enables the creation of a scalable environment that integrates different applications and data. IBM Product Lifecycle Management solutions use Web services in a service-oriented architecture (SOA) specifically designed for the automotive industry. The Web services are self-contained modular applications that can be mixed and matched to build completely new applications or be modified as business conditions require.

Key software offerings used by IBM Product Lifecycle Management solutions include IBM WebSphere® application infrastructure and integration software, DB2 information management software, Tivoli IT Service Management software, IBM Lotus® collaborative software and IBM Rational® software development and portfolio management software.

## **IBM Research**

While companies struggle to differentiate themselves and their offerings with innovations, they must breathe new life into their development processes as well. IBM's innovative approach to help streamline and simplify complex design and development processes is to take a holistic view based on Systems Engineering principles. IBM's Research Division invests more than US\$5 billion annually in research and development and "first-of-a-kind" projects to enable client solutions, such as the Integrated Systems Design project. This project is a global initiative providing a modeling framework that includes a middleware infrastructure to achieve a consistent integration and traceability of elements beyond the boundaries of engineering, and brings them together in the product development process.

**IBM services**

Through our assessment and design services, IBM Business Consulting Services professionals can evaluate your current business processes, as well as your applications and infrastructure. Our innovative assessment methodologies and tools help pinpoint where your company can get the greatest ROI and create a roadmap for you to achieve the results. We then work with you to design a solution for transforming your processes efficiently and effectively; this may include outsourcing of selective processes or infrastructure management to help you achieve new productivity breakthroughs.

System integration and application development services are provided by IBM Information Technology Services, which has combined its business and technology teams to become one of the world's best system integrators and outsourcers.

**IBM business partners**

IBM works with a large global network of software vendors enabling us to provide best-in-class solutions from such automotive industry leaders as: Centric, CD Adapco, Dassault Systemes, Engineous, ESI, Fluent, IDe, Matrix One, Mecalog, MSC.Software, and SAP.

**IBM financing**

As the world's largest provider of IT financing, IBM Global Financing can help you optimize your investments, regardless of your company size, type or location. IBM Project Financing™ offerings provide customized, comprehensive financing that allows you to match cost outlays to expected benefits.

***Start your business down the road to competitive advantage***

Allow IBM to assist you in your search for continuous product lifecycle innovation. Let our experts help you configure a solution to meet your specific business requirements while building upon your existing investments.

*For more information*

To learn more about the IBM Automotive Product Lifecycle Management solutions, visit:

**ibm.com**/solutions/plm/automotive

And, for more information about IBM's entire solution portfolio for the automotive industry, visit:

**ibm.com**/industries/automotive

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<sup>1</sup> "Reuse of Software in Distributed Embedded Automotive Systems", B. Hardung, T. Kolzow, A. Kruger

<sup>2</sup> "The Coming Age of Collaboration in the Automotive Industry", Mercer Management Journal, J. Dannenberg, C. Kleinhans (www.mercerm.com/mmj)





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