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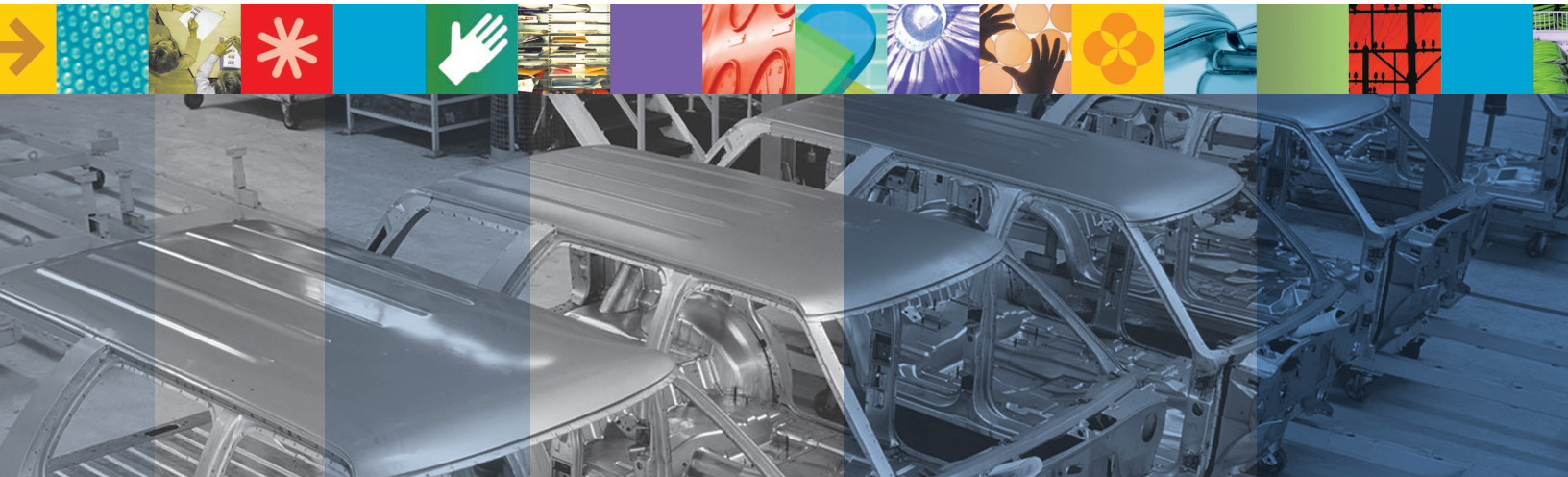
# Help optimize manufacturing speed, efficiency and flexibility to drive profitability.

Highlights

- Help minimize costs and speed time to market by reusing proven, flexible processes and industry-standard technologies

- Help drive efficiency and quality by leveraging real-time visibility into multiple plant floor processes, which improves machine utilization and safety

- Help optimize enterprise responsiveness by giving manufacturing personnel the information they need to quickly and easily create and refine key production processes

The need to boost manufacturing productivity without interrupting daily operations

In a constantly changing global marketplace, automotive companies must make rapid adjustments to their manufacturing processes so they can respond appropriately to consumer whims, competitive offerings and evolving technologies. But most automotive manufacturers rely on old proprietary technology at aging facilities to drive their manufacturing floor processes. To keep the technology working, most manufacturers hard-wire parts and pieces together — leading to excessive maintenance and integration costs.

With a complex, inflexible infrastructure, automotive enterprises find it nearly impossible to link the diverse people and applications from around the world that are involved in today's manufacturing processes. To reduce inventory costs without impacting plant output, the right information must be available. You can help improve automotive manufacturing processes without ripping and replacing your existing infrastructure or disrupting operations when you leverage IBM software for automotive manufacturing productivity.

ON **DEMAND BUSINESS**™
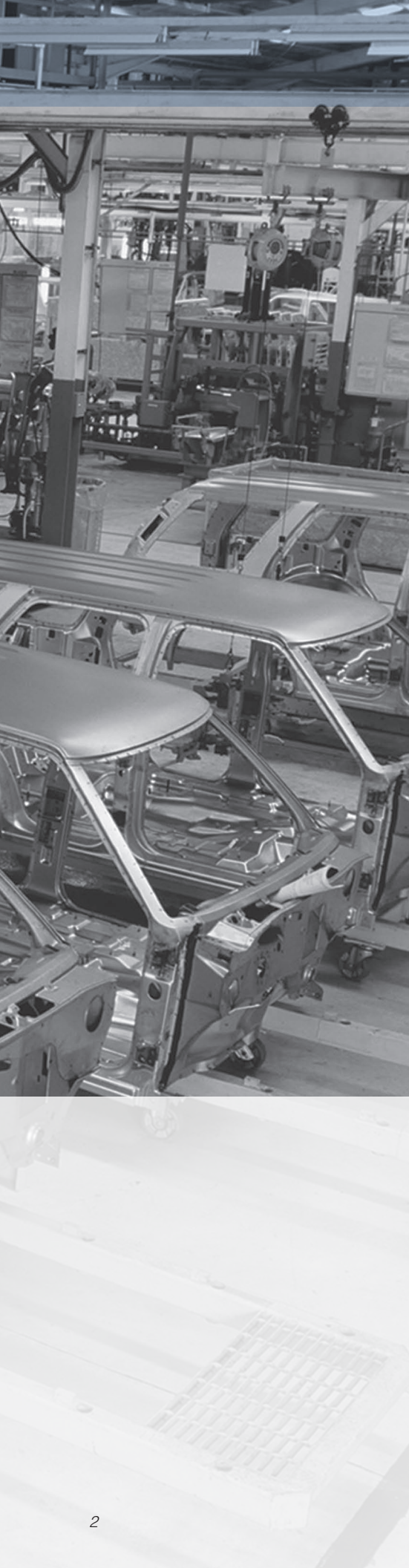
Leverage IBM's automotive industry expertise to help transform your manufacturing processes

IBM solutions for the automotive industry bring together the extensive IBM portfolio of hardware, software and high-value services — and its wide network of Business Partners — to address the most prevalent challenges for clients in the industry. IBM solutions and automotive industry experience help each client accelerate its progress in becoming an On Demand Business — so it can respond with flexibility and speed to virtually any customer demand, market opportunity or external threat.

Creating business processes with a *service orientation* has emerged as the best way to achieve that flexibility and speed, as well as agility and resilience. Service orientation takes everyday business applications and breaks them into individual business tasks, called services. These services can then be shared with other departments within your company, integrated with your trading partners and exposed directly to customers to create new or modified business processes. As a result, you

have the flexibility to easily respond to changing market requirements. And because these services can tie together existing enterprise resource planning (ERP), human resources (HR), customer relationship management (CRM) and supply chain systems from leading vendors such as SAP, Oracle, Siebel and JD Edwards, there is no "rip and replace" required. Furthermore, these services can be used across multiple processes — rapidly, easily and consistently — to help drive improved time to value and reduced costs.

IBM software, a key building block of the IBM solutions for the automotive industry, is vital to employing a service orientation strategy. It helps our clients achieve business flexibility by enabling them to model, assemble, deploy and manage business processes for today's on demand business environment.

With IBM software for automotive manufacturing productivity, you can utilize proven, integrated tools, processes and services from IBM and IBM Business Partners to help improve your manufacturing operational efficiency, enhance collaboration and streamline business

Automotive manufacturing productivity at a glance
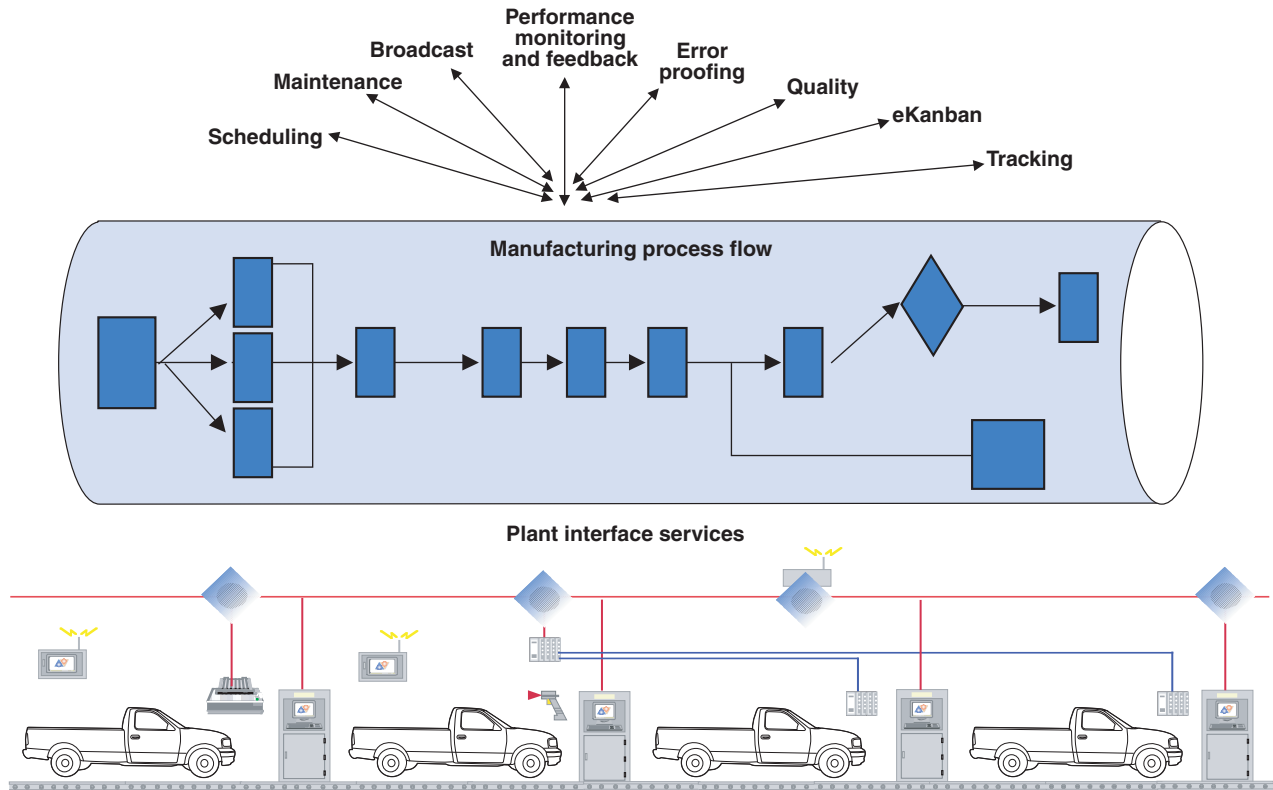
IBM software for automotive manufacturing productivity helps you provide a foundation for multiple aspects of automotive manufacturing plant integration.

processes from the shop floor to the top floor. Because IBM software for automotive manufacturing is built on leading-edge, industry-standard technology, it can help you evolve your IT infrastructure into a tool that drives profitability and creates a competitive edge.

These offerings help your business:

- Integrate manufacturing processes to help reduce costs.
- Share real-time plant information to improve decision making.
- Empower manufacturing engineers to help optimize plant operations.

Integrate and automate processes for efficiency and quality

Typically, automotive manufacturing plants rely on a highly skilled IT department to piece together disparate systems and applications — some from assorted vendors, others that are homegrown and based on antiquated
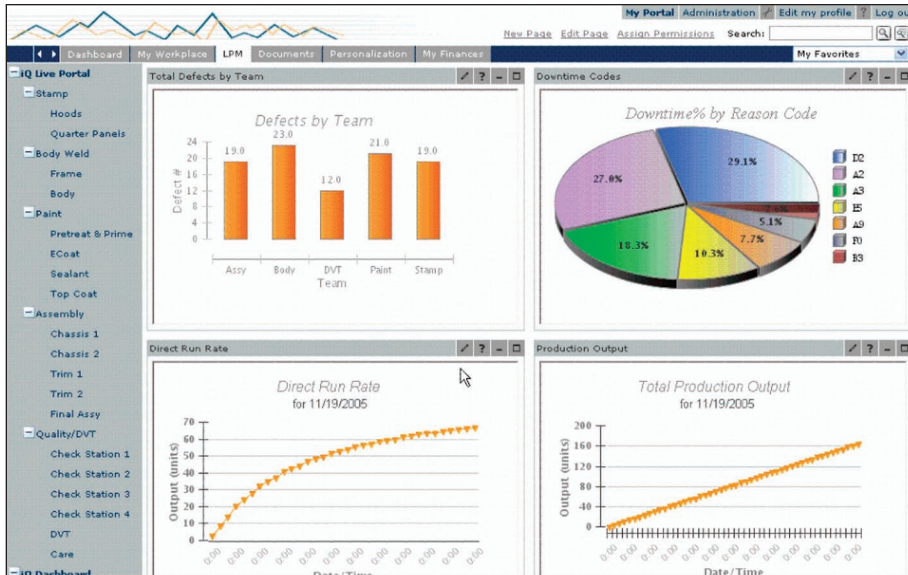
Plant manager's business measurement dashboard

technologies. Although this pains-taking, point-to-point integration works at a basic level, it can be inefficient and expensive. And it rarely facilitates smooth information flows among your widespread plant floor devices, control-lers, designers, engineers, operators, maintenance technicians and suppliers.

With integration technology that is part of IBM software for manufacturing productivity, you can evolve your manu-facturing operations gradually, starting with just one application in one plant and growing to a highly available infra-structure for the plant. So there's no need to rip and replace your existing applications to take advantage of the

IBM approach. The IBM integration strategy relies on open standards–based technologies that facilitate broader initiatives such as adopting a service orientation and deploying Web services. IBM software for automotive manufacturing productivity helps you optimize integration systems, supply chain management (SCM) systems, production management, asset management and enterprise manage-ment systems.

Using IBM technologies, you can quickly replicate successful processes and systems across geographies and companies — bolstering your efforts to get products to market quickly. You can

integrate a variety of plant floor informa-tion with enterprise and supply chain systems, including those of suppliers. For example, you can use integration to capture real-life feedback from plant floor experience to help optimize main-tenance procedures. And you can stay on top of each supplier's ability to meet forecast demands.

IBM offers prebuilt process templates designed to give you a head start in developing services and busi-ness processes to automate the plant floor and connect it with your enterprise systems. IBM Automotive Manufacturing Productivity Solutions have a number of templates that include architectures, models, scripts and application code:

- IBM Automotive Manufacturing Productivity Solutions — shop to enterprise integration for line sequencing.
- IBM Automotive Manufacturing Productivity Solutions — shop to enterprise integration for error proofing.
- IBM Automotive Manufacturing Productivity Solutions — shop to enterprise integration for asset performance management.
- IBM Automotive Manufacturing Productivity Solutions — shop to enterprise integration for inventory management.
- IBM Automotive Manufacturing Productivity Solutions — shop to enterprise integration dashboard.

For reuse of best practices to increase your productivity, consider using the shop to enterprise integration for inventory management process template to help place the correct seats in the right vehicles. First, production planners import a seat order and view it using an order management workbench. After invoking a production sequencing function, the planner creates a master floor sequence. The planner sends the master floor sequence to suppliers and to the manufacturing execution system (MES), which sequences work for each station. Next, the ERP system sends suppliers the part and sequence numbers on a just-in-time basis — just before the parts are needed. The supplier then tells the manufacturer which seats will arrive on what pallets.

When the truck arrives, the pallet radio frequency identification (RFID) tags are read and matched so they're sent to the assembly line in the right order. The seat RFID tags are also read and matched to the pallet tags. Next, the vehicle goes to a station where it passes another RFID reader. The RFID seat tags are then matched to the vehicle identification number (VIN) before as-built data is collected.
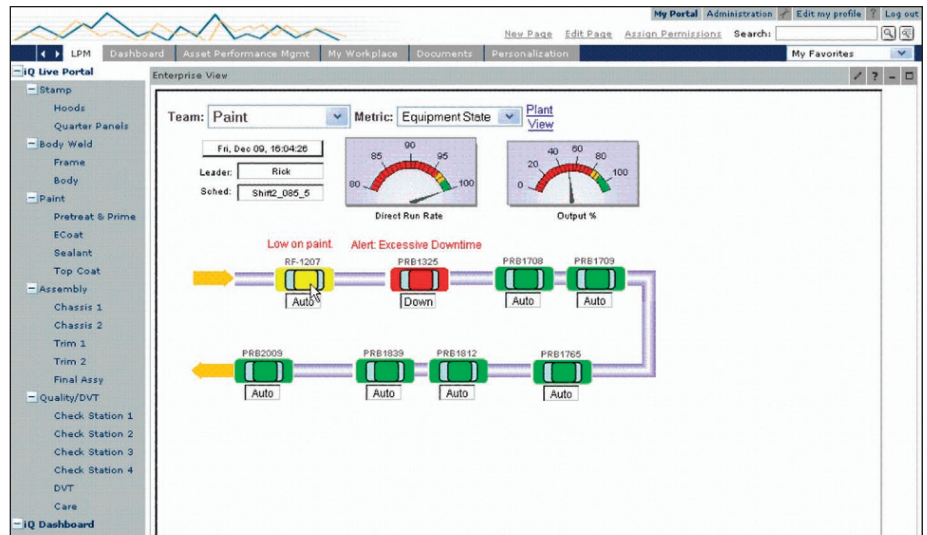
Supervisor's real-time visibility to plant processes

At each point in the assembly line process, the ERP system is notified. Other systems, such as the financial and SCM systems, are also updated. Errors at plant floor stations are communicated to quality control stations.

Capture real-time information to help make informed, intelligent decisions
In many automotive assembly plants, managers get information about various stations in the plant through reports that are compiled overnight. Others receive e-mails or simply verbal reports from a plant floor foreman. In any case, by the time managers receive information about material flows or workstation equipment conditions — such as that related to equipment utilization — a significant amount of time has elapsed.

Utilizing the shop to enterprise integration dashboard, you can monitor critical plant activities at the shop floor and enterprise level by viewing information from the plant floor through a Web-based dashboard that is updated approximately every 20 seconds. Real-time feedback on workstation and equipment — such as throughput, error rate and downtime — can help you forecast and manage more effectively.

For example, a sensor on a torque gun can be set to gather data and send it to the programmable logic controller (PLC) on an ongoing basis. In conjunction with the MES system, this data can be continuously analyzed for trends. If the prognostics system predicts early failure, an alert is generated and sent to the preventative maintenance system. At that point, the stack light is switched to yellow. Next, the preventative maintenance system modifies the maintenance schedule for the torque gun and generates a work order for a maintenance engineer. When the engineer repairs the torque gun, the maintenance, repair and overhaul (MRO) system notifies the MES system that the gun is fixed, and the stack light is reset to green.

You can use the shop to enterprise integration dashboard to enable supervisors and plant managers to spend less time manually coordinating information from across multiple screens and information sources — and more

time making intelligent business decisions. For example, they can see in real time when a piece of equipment has a 50 percent or a 40 percent utilization rate. And they can rapidly diagnose issues like equipment failures, then take appropriate actions. The shop to enterprise integration dashboard process template is automatically included when you implement any of the other shop to enterprise integration process templates.

Empower manufacturing users to direct plant floor processes for business advantage
Leveraging the portal-based IBM automotive manufacturing productivity workbench, nonprogrammers such as manufacturing plant process engineers can create and link plant processes and applications. As a result, business people — who best understand the complex trade-offs between equipment, workflow, setup and changeover times, and batch sizes — can jump-start the optimized definition, customization and reconfiguration of the processes you

use to plan, track and manage production of automobiles and components. The result can be simplified, speedy and cost-efficient manufacturing plant operations.

First, process engineers use a role-based desktop to create services — such as "update vehicle location," "find vehicle by VIN," "find vehicle by ID," "update vehicle history" and "collect build results." Next, the engineers quickly configure services into new logic workflows. For example, you can use services to create a workflow for broadcasting data when build events occur. A manufacturing event message on the floor could trigger the process to first "find vehicle by ID," then "update vehicle location" and finally "update vehicle history."

IBM software for automotive manufacturing productivity is built on IBM WebSphere® Portal, IBM Rational® Application Developer for WebSphere and IBM WebSphere Business

Integration Server Foundation, or IBM WebSphere Process Server. Leveraging this infrastructure directly and with applications from ISVs such as those from Rockwell Automation, you can represent every application and resource in your plant as a service (or component) with a single interface, so it can be invoked as needed and monitored to help minimize downtime. The solution provides special templates for order management, data collection, wireless tracking, broadcast and supplier integration. The templates work together to help you build responsive and flexible manufacturing environments:

- Create new standards-based Java™ 2 Enterprise Edition (J2EE™) applications as needed.
- Create Web services that provide access to existing applications.
- Catalog new services so they're available for reuse in additional processes.
- Deploy the services to the workbench portal and application server.

Business Partners help further leverage IBM software capabilities

IBM software for automotive manufacturing productivity is complemented by applications and services provided by our IBM Business Partners — including the hundreds of Business Partners specializing in service orientation — helping to make this solution a world-class foundation for cost-effectively optimizing the flexibility of your manufacturing processes. Working in partnership with our clients, IBM and IBM Business Partners can help meet the needs of today's automotive companies.

For more information

IBM is unique in its combination of unmatched automotive industry experience, deep service orientation skills, unparalleled Business Partner network, and software and technology product excellence — and as a result is a clear leader in service orientation. We can help you get started with service

orientation, whether for the enterprise, a departmental initiative or a single project. IBM is the ideal partner for automotive companies seeking to meet the challenges of maximizing flexibility of the manufacturing environment, launching new products into the market quickly and efficiently, minimizing the cost of both production and nonproduction operations, and enabling repeatable processes for global rollout.

To learn more about IBM software for automotive manufacturing productivity and other automotive industry–specific offerings, contact your IBM representative or IBM Business Partner, or visit **ibm.com**/software/industries/auto

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