



SOA for PLM

Empowering PLM with SOA

Leveraging the IBM Service-Oriented Architecture (SOA) Foundation to provide infrastructure support for your PLM systems can help your company achieve the flexibility and integration needed to manage your product-related intellectual capital—from initial conception to retirement. IBM's industry extensions to the SOA Foundation to support PLM help you apply an SOA approach to your product lifecycle management business processes which can deliver crucial PLM data across your enterprise. This can result in better decision making and greater customer value.

Integrate. Exchange. Evaluate.

Turning innovative ideas into market-leading products requires flexible business processes supported by integrated PLM solutions. You need a single view of information on which to base business decisions. The infrastructure that provides this information must be able to adapt quickly to new business models and processes. Applying flexible SOA approaches to the PLM business domain enables PLM applications to communicate with various business applications—such as ERP, CRM, SCM and even other PLM applications—despite the fact that they "speak" different languages.

By integrating your PLM applications with the rest of your enterprise, you can:

- Share and reuse a single product definition across virtually all aspects of your enterprise and beyond.
- Align your systems and processes internally and with those of your design partners, suppliers, dealers and service providers.
- Make product information easily available across systems.
- Automate business procedures prone to human error.



Integration is the key to business flexibility

By integrating PLM and other enterprise applications with SOA, your company can realize:

- Improved data integrity and control between systems by automating

synchronization of product data based on product lifecycle events.

- Faster time to market with higher quality products as a result of earlier availability of design and change information to downstream users.
- Improved business agility and market responsiveness by automating flexible business processes across your extended value chain.
- More cost-effective product designs due to engineers having easy access to key ERP information, such as price, availability and lead times.
- Greater user productivity and successful product launches resulting from state-of-the-art management of product, partner and customer data.

An SOA approach to PLM integration and collaboration

Which of your company's business processes would benefit from access to the latest product development information? How easily can decision makers—outside of product engineering—get timely access to PLM information repositories? The sooner your front-office operations know what's coming out of the laboratory, the more time you have to plan product launches, marketing campaigns, distribution logistics and more. PLM systems connected to other enterprise systems by flexible business processes that are enabled through service-oriented architecture (SOA) can speed up the process.

Trust in our integration experience

IBM and our IBM Business Partners have built PLM industry extensions for the IBM SOA Foundation, extending the value of applications and business processes that currently run your business, not replacing them. Our broad portfolio of software and investment in SOA is virtually unmatched and we:

- Can help enable SOA patterns for an efficient and reusable approach to application integration and process re-engineering.
- Invest more than US\$1B a year around SOA and Web services.
- Support component-based applications and interoperability—with SOA, you simply plug in new business processes, applications, systems and devices, or combine them individually.

- Provide a unique combination of consulting, applications, middleware, hardware, services, and a broad knowledge of industries and IT solutions to fit businesses large and small.

Beat your competition to market

The faster you can get the right product to market—ahead of your competition—the greater your profit potential. And if your company can't respond quickly to changing customer demands, market conditions, competitive landscapes, and mergers and acquisitions, your very survival may be in question.

Your current speed may be hampered by a heterogeneous design environment or legacy applications that hinder collaboration with design partners and suppliers—even different departments throughout your enterprise. An SOA-enabled infrastructure is designed to lift the barriers of communication between these complex systems to help your company:

- Gain a more cost-effective product design process due to engineers having access to key ERP information such as price, part availability and inventory levels.
- Speed up manufacturing planning steps that are affected by engineering data and processes.
- Reduce the cost of late cycle changes resulting from data entry errors.
- Increase parts re-use and decrease the cost of managing a larger parts inventory.
- Plan to procure the right parts or material at a low cost, in time to meet production schedules.
- Respond faster to customer requests for quotes.
- Increase productivity and help lower education costs by reducing the number of applications employees must learn to use.
- Reduce costs of writing and maintaining customized code running on top of applications.

Take action to improve results

One of the world's leading electrical equipment manufacturers implemented SOA with PLM to obtain:

- A single, unified design database of both mechanical and electronic files.
- Integration with their ERP system, enabling enterprise-wide access.
- A collaborative design and development environment.

Our client has reaped the following benefits:

- Product development time has shortened by 30 percent (from 48 to 35 days).
- Bill of materials (BOM) error rate has decreased from 28 percent to 17 percent.
- Mechanical design quality has improved by 70 percent.
- Electronic design errors have been reduced.

Realize a proven return on investment

Just by integrating PLM and ERP systems, CIMdata research, conducted in September 2005, reported the following benefits:

- 75 percent reduction in the time, cost and errors associated with re-keying data entry from one system to the other.
- 75 percent reduction in bill of materials (BOM) error cost as they are created once and then managed consistently in both PLM and ERP.
- 15 percent reduction in inventory costs as the result of designers and engineers knowing what parts are already on hand and incorporating them into new versions of products—improved parts re-use.
- Eight percent reduction in scrap of materials that cannot be used in production and which were either already in inventory or ordered before procurement was aware of pending changes.

Reduce the cost and time to maintain complex systems

For IT to contribute to your company's business growth, it must be aligned with business goals. It must be responsive. It must enable successful projects. If your IT infrastructure restricts growth, applying service-oriented architecture (SOA) to support your IT infrastructure can help reduce the number, size and complexity of custom interfaces and integration points you need to build and maintain.

Team with experienced professionals

IBM offers a broad portfolio of software for your SOA and an extensive ecosystem of partners and independent software vendors to help implement your solution, including IBM Business Partners in the SOA specialty who have agreed to specifically support IBM's SOA for PLM reference architecture.

- IBM has more than 300 SOA-related patents and has been named by leading analysts as "leaders" in eight SOA-

relevant categories. We also invest more than US\$1B per year in SOA.

- We offer a broad portfolio of software for SOA, the underlying approach used to simplify enterprise integration, relied upon by over 87,000 customers.

In addition, we provide:

- More than 6,700 IBM developers and 10,750 IBM Global Business Services and IBM Global Technology Services practitioners trained on IBM WebSphere®.
- More than 1,200 certified IBM PLM consultants.
- More than 900 engineering and technology solutions professionals.
- More than 500 Application Management Services and Business Integration skilled professionals.
- Nearly 200 IBM PLM Business Partner organizations based in 50 countries around the world, employing more than 2,000 qualified PLM professionals.

Improve business agility and market responsiveness

IBM's PLM industry extensions for the IBM SOA Foundation provide a comprehensive, modular middleware platform for the development and operating environments of SOA-based solutions. It can help you:

- Reduce time with reusable modules of services and composite business processes across multiple applications.
- Extend your reach to any service across your enterprise, with less cost through the single SOA for PLM reference architecture.
- Solve high-level business problems more quickly and easily.

Depending on your unique needs, your SOA for PLM infrastructure may include the following components.

- IBM WebSphere Process Server delivers:
 - One programming model to connect and utilize IT resources as service components.
 - Rapid assembly of business solutions by wiring reusable service components.
 - Constructs for dynamic processes, including business rules, business-state machines and selectors, events, and role-based tasks and capabilities.

- IBM WebSphere Enterprise Service Bus provides Web services connectivity, Java™ Message Service (JMS) messaging and service oriented integration to power your SOA.
- IBM Websphere Service Registry and Repository enables centralized management of business services and interactions among SOA infrastructure elements.
- IBM WebSphere Business Monitor delivers customizable dashboards with scorecards, key performance indicators (KPIs), and gauges for multidimensional analysis and reports with embedded business intelligence.
- IBM Information Management software to extend PLM information to sales, marketing and services, and facilitate parts reuse.
- IBM Tivoli® software for managing composite business applications and accessing security-rich data across the value chain.
- IBM Lotus® software for real-time PLM collaboration across the value chain.
- IBM Rational® software for software and systems development, portfolio and program management, requirements management, and integrated change management across the entire system.
- A variety of best-of-breed SOA-enabled enterprise and PLM applications from IBM Business Partners.

European cruise liner manufacturer implements SOA for PLM

A market leader in the cruise ship industry turned to IBM to improve their manufacturing operations. IBM is providing a Web services-based solution that helps them automate workflows, manage process changes and tasks more efficiently, and provide timely communications between engineering and manufacturing to expedite ship building. Our SOA solution integrates their legacy applications and:

- Enables more efficient change management between manufacturing and engineering with ENOVIA LCA.
- Provides virtual real-time communications with suppliers by integrating applications, including legacy applications, and enabling them to interface through Web services.
- Aggregates information and automates tasks through business-oriented services and business process modeling with IBM WebSphere Process Server.

Significantly lower cost to implement

IBM has completed more than 20 joint customer Business Integration Value Assessment studies where we have helped customers quantify the value

of implementing an SOA infrastructure to support their IT systems. The data indicates that it is 35 percent less expensive to implement IBM middleware and 77 percent less expensive to maintain or upgrade the software than utilizing a point-to-point or build-your-own approach.

SOA for PLM is designed to significantly lower the total cost of enterprise application integration systems.

- 35 percent lower integration costs
- 80 percent lower upgrade costs annually
- 50 percent lower maintenance costs per year

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