Digital Manufacturing from IBM

Support processes from concept to production

Manufacturers are faced with an increasingly demanding and challenging global environment. To be competitive, your business must continuously improve productivity, lower costs, compress delivery times and enhance the quality of products. Implementing a digital manufacturing solution from IBM can help you incorporate more efficient processes to create a lean production operation.

The value of digital manufacturing

Digital manufacturing from IBM helps define the steps necessary to build a product, test the steps for accuracy, then generate machine and work instructions for manufacturing the product. Utilizing a digital product model, our solution works with product definition data to support part and assembly planning, process design, visualization, simulation and other analyses to digitally plan, validate and optimize your manufacturing process. This can shorten time to production, dramatically reduce the need for rework, and improve craft labor utilization and efficiencies.

Provide a bridge between design and manufacturing

Digital manufacturing from IBM enables your business to manage and synchronize product and process information from idea conception to the end of product life. It can also help you:

- Optimize your design and manufacturing cycle time.
- Reduce production schedule variances.
- Avoid “unbuildable” or ergonomically-unsafe conditions.
- Minimize change orders after design freeze.
- Shorten the response time to changes and unplanned conditions.
- Provide early assessment of design for production.
- Improve the efficiency of manufacturing processes.
- Re-use parts, assemblies, equipment and processes.
- Better comply with industry and government standards.
- Increase return on production assets.
- Reduce costs and accelerate time to market.

Achieve “manufacturing-ready” status

Companies need to guarantee that their innovative new products are manufacturing-ready before actually launching into production. They are also challenged to reduce time to market, while boosting product quality across variable volumes and maximize their returns on investments. Ensuring this level of product manufacturability and profitability is difficult given expensive physical prototypes and delicate machinery. Production lines can also be a source of hold-ups, quality errors and human performance constraints. Digital manufacturing from IBM can help.

Build on our experience

IBM has worked with thousands of manufacturers of all sizes around the world to implement solutions designed to enhance product development and streamline manufacturing processes.

- Product lifecycle management (PLM) solutions from IBM have become the industry standard for OEMs, supply chain partners and suppliers.
- IBM has over 31,000 PLM customers worldwide in a wide range of industries—including automotive, aerospace, industrial products, electronics, and chemicals and petroleum.
- IBM doesn't just install technology—we serve as your trusted advisor to provide the best-of-breed PLM applications, IT environment, integration capabilities, and business strategy to help you meet business objectives.
- IBM and Dassault have one of the largest PLM practices in the world with over 2,000 application engineers and consultants across Americas, Europe and Asia Pacific regions.

[1]CIMdata, The Benefits of Digital Manufacturing, March 2003.

A highly-collaborative work environment

Empowering your company with digital manufacturing as part of an overall PLM strategy can revolutionize the product lifecycle by creating new value and innovation at each stage of the process. Digital manufacturing from IBM can help in the following areas.

- Translation of design data to manufacturing
- Process planning
- Production operations planning and machining process planning
- Assembly definition and sequencing
- Detailed line, cell, station and task design
- Quality measurement and reporting
- Manufacturing documentation, shop floor instruction and collaboration

Key benefits of our digital manufacturing solution can include:

- Comprehensive process planning in the early design phase.
- Validated and simulated production requirements.
- Ability to train human operators and line staff more quickly and effectively.
- Access to a collaborative environment for concurrent design and manufacturing engineering.
- Reuse of best practices and enterprise knowledge.
- Ability to anticipate and remedy potential problems in the pipeline.
- Reduced production costs.
- Reduced overall time to market.

The Digital Engine takes off with PLM

We have helped many companies achieve or exceed both their initial objectives and the benefits expected from digital manufacturing, including Pratt & Whitney Canada (P&WC). The company is among the world's leading designers and manufacturers of turbofans, turboprop and turboshaft engines for regional, business, utility and military aircraft as well as helicopters.

P&WC implemented an IBM and Dassault Systèmes solution based on CATIA V5, ENOVIA and DELMIA to develop aircraft engines using digital technology through the entire product lifecycle. As a result, it reduced time to market, improved collaboration with partners and saved millions of dollars per year. The solution helped the company:

- Reduce time to market to maintain competitiveness.
- Manage seamless collaboration among an ever-growing number of partners worldwide.
- Empower innovation with a PLM solution that covers the entire engine development process.

An independent ROI study

CIMdata, a leading and independent worldwide consultancy specialized in PLM strategy, performed an independent return on investment (ROI) study[1] on P&WC's implementation of IBM and Dassault Systèmes PLM solutions. The study was based on P&WC data on the benefits of PLM versus the cost of implementation (software, hardware, training, maintenance and administration).

CIMdata took a conservative approach when measuring P&WC ROI. The study findings show excellent ROI for a large PLM deployment in the first phase of implementation.

- Payback period is three years
- Net present value of investment (over six years) is superior to US$12M
- Internal rate of return is 54%

Simulate your total production system

Continuous operational improvement is mandatory. For long-term viability, many manufacturers are going digital. Digital manufacturing from IBM enables concurrent engineering from the conceptual phase of product and process design, through simulation and monitoring of manufacturing processes, to shop floor operations. Based on Dassault Systèmes' DELMIA software, our solution allows manufacturers to virtually define, plan, create, monitor and control their processes.

Why IBM for digital manufacturing?

IBM can deliver the tools necessary to quickly deploy advanced planning applications. We can help you streamline processes, improve operations, and ramp-up production faster and more efficiently.

- IBM has completed more than 10,000 successful PLM implementations.
- In an independent report, CIMdata concluded that Dassault Systèmes' DELMIA digital manufacturing software is a core technology for companies seeking to save time, reduce cost and optimize their return on investment[1].
- IBM Global Business Services offers a complete suite of services offerings around the DELMIA, CATIA, ENOVIA and SmarTeam products including business transformation consulting, planning, implementation, integration, training, support and managed services.
- IBM PLM software tools can be readily configured and tailored to your unique needs and include digital mockup and virtual modeling capabilities, which can help ensure flexibility and engineering efficiency.

Configured to meet your digital manufacturing needs

IBM offers solution integration and implementation services encompassing portfolio planning, concept development, design, production and testing, and maintenance and support. Depending on your unique needs, our digital manufacturing solution may include:

- Dassault Systèmes DELMIA V5R17—achieve maximum production efficiency, lower cost, improved quality and reduced time to market, from early process planning and assembly simulation to modeling welding lines.
- Integration with other PLM solutions from IBM, other CAD and PDM solutions, as well as critical enterprise applications such as ERP, CRM and MES.
- PLM infrastructure solutions, including Lotus Notes® for collaboration, IBM information management solutions for information federation, and IBM WebSphere® for Business Process Management.
- IBM hardware solutions such as workstations, servers and storage.

Revolutionizing aircraft development

Dassault Aviation, a world leader in the executive aircraft market, must develop its aircraft in concert with a geographically disperse team of global partners. They chose Dassault Systèmes V5 PLM to create the world's first virtual development platform. Their goal was to enable Dassault Aviation and its 27 partners in Europe, the USA, and Canada to concurrently design the Falcon 7X from their home sites. The company linked its partners through a single, virtual collaborative workspace in which they shared a common, configured, constantly-updated digital mock-up of the Falcon 7X.

"Thanks to the virtual platform, we were able to work together right from the conception stage, sharing the same database and the same tools, which is something we could not do in the past," said Jérôme Camps, aerospace engineer, Dassault Aviation.

Since the Falcon 7X was entirely defined with 3D digital precision prior to assembly, including 40,000 parts, 200,000 fasteners, and the aircraft's sophisticated equipment and systems, Dassault Aviation was able to construct a business jet of unparalleled quality.

Achieve a reduced cost of ownership

Digital manufacturing from IBM can help provide more effective manufacturing planning and production efficiency. Optimize your production environment by establishing more automated and effective process planning, plant design and workflow simulation. Our solution can help you:

- Virtually define, plan, create, monitor and control manufacturing processes.
- Facilitate lean production and concurrent engineering.
- Support the "communization" of components.
- Increase compliance with standards.