

# Bombardier Aerospace adopts a fresh approach to PLM to get its new jets in the sky faster.

## Overview

### ■ **Business Challenge**

*To stay ahead of the competition, Bombardier Aerospace needed to cut two years from its design-to-manufacture cycle. While the company relied heavily on product lifecycle management (PLM) tools to streamline its design processes, it was looking for a way to get these tools in place faster without disrupting its core business focus.*

### ■ **Solution**

*In a shift from its traditional PLM strategy, Bombardier embraced a novel managed-services model, which—by outsourcing all aspects of its PLM systems to a provider with a deep portfolio of PLM best practices—enables Bombardier to ramp up for new aircraft programs faster and extract the maximum benefits from the newest PLM capabilities.*

### ■ **Key Benefits**

- *40 percent increase in the efficiency of complex machining processes associated with a new wing design for Bombardier's latest aircraft program*
- *Estimated \$30 million reduction in costs associated with deploying and maintaining PLM over 5 years*
- *Faster time to market and improved ability to meet increasingly demanding customer delivery schedules*



*Bombardier Aerospace is a world leader in the design and manufacture of innovative aviation products and services for the regional and amphibious aircraft markets. Based in Montreal, the company has developed 23 successful new aircraft programs since 1989. Bombardier's newest regional jet, the 100-seat CRJ1000 NextGen regional jet (pictured above) was designed to provide significant operating cost advantages and improved passenger comfort.*

One of the key trends in the aircraft industry today is an increase in the importance of speed. It's not so much a question of how fast an aircraft can go, but of how fast manufacturers can react to the rapidly changing needs of the marketplace. One of the most important changes the airline industry has witnessed in recent years is the growth and success of regional carriers, which has stoked an unprecedented degree of competition in the industry.

*“Bringing new planes to market faster is a key challenge facing all aerospace companies. By taking an out-of-the-box approach to PLM, we’re able to meet even the most demanding delivery schedules.”*

– Jocelyn Gauthier, IT director, Engineering & Supply Chain, Bombardier Aerospace

## ***A new way of deploying and using PLM design yields major time-to-market benefits***

### **Business Benefits**

- 40 percent increase in the efficiency of complex machining processes associated with a new wing design for Bombardier's latest aircraft program
- Estimated \$30 million reduction in costs associated with deploying and maintaining PLM over 5 years
- Improved ability to optimize PLM performance by incorporating global best practices in aerospace
- Faster time to market and improved ability to meet increasingly demanding customer delivery schedules
- Elimination of time, effort and cost of acquiring highly specialized PLM technicians over the multiple phases of a new aircraft program

For aircraft manufacturers, the ramifications have been significant, as it has led to an increase in the demand for jets that are best suited to the needs of regional airlines. At the same time, because regional airlines have to keep their costs low, there is increasing pressure on manufacturers to continually push the envelope on aircraft efficiency, comfort and performance. More than ever, the key to success for manufacturers is the speed with which they can bring innovative aircraft designs to market.

### **In with the new**

On this measure, no regional aircraft manufacturer has been more successful than Bombardier Aerospace ([www.bombardier.com](http://www.bombardier.com)). Since 1989, the Montreal-based aerospace giant has developed 23 successful new aircraft programs and, in the process, has become the world's leading manufacturer of regional jets in the 50- to 100-seat segment. In addition to the innovativeness of its products and the skill of its engineers, Bombardier owes much of its success to the high level of efficiency it has been able to achieve within its design and manufacturing processes.

Bombardier was one of the first aircraft manufacturers to grasp the extent to which product lifecycle management (PLM) technology could streamline and shorten the design-to-manufacturing cycle by integrating engineering data and enabling it to be shared globally. Its chosen tool was the Dassault Systèmes Product Lifecycle Management Solution, whose components include CATIA (which provides an interactive, 3D model of designs and parts, while storing all product information) and ENOVIA (which enables globally dispersed teams to collaborate on designs and changes, while keeping the overall design up-to-date).

Since it was first deployed with the assistance of IBM, Bombardier's PLM solution has helped the company revolutionize its design processes, shortening the overall cycle and strengthening the company's ability to meet its customers' demanding delivery deadlines. One invaluable source of time savings is the ability of engineers to re-use parts and assemblies from other aircraft programs to jump start projects quickly. Another is the way the PLM solution helps Bombardier's engineers track and manage design changes—even if the teams are half a world apart—thus avoiding errors and the need to rework designs.

### **Investing smart**

With its decision to launch a new aircraft program, Bombardier made a bold commitment to cut two years from the time required to get the plane from the drawing board to the tarmac. Achieving this goal would require a step improvement in its already-efficient design-to-manufacturing processes.

*“We saw outsourcing PLM as a way to leverage global best practices while substantially eliminating the extra work of ramping up PLM for new aircraft programs.”*

— Jocelyn Gauthier

Its first decision was to upgrade its PLM solution to the newest version, V5. But the company's design optimization efforts didn't end there. Bombardier knew that the setup of a new PLM system to support a new aircraft program had a lot in common with the setup of a new aircraft production line, the latter requiring costly and time-consuming investments in highly specialized tooling equipment that needs to be configured just right and –when it's no longer needed–has to be disassembled. In the same way, the complexity of PLM systems dictates the need for a mix of highly specialized IT-based skills to both deploy and manage the system in a way that ensures the maximum benefit to the engineers using it.

To support the approaching program the traditional way, Bombardier would need to find and hire as many as 60 highly trained PLM specialists over the course of the program. A further caveat was that the mix of skills in demand would change as the aircraft program progressed from one stage to the next. It wasn't only the difficulty, time and effort required to find such skills –expertise in the modeling of composite materials, for example–but also the fact that these experts would ultimately need to be discharged when their jobs were done. To Bombardier's planners, this approach was less than optimal because it applied a fixed cost model to what was, in reality, a variable-cost situation.

As a company striving for optimality, Bombardier took a closer look at its options and began to see outsourcing as a promising alternative. Moreover, while it sought to get the most benefit from PLM, the company had no intention of assuming the risks and costs associated with deploying a “bleeding-edge” PLM solution. It would instead turn to an experienced outsourcing partner that would not only mitigate its implementation risks, but would also enable Bombardier to leverage the lessons that come from deploying some of the world's most sophisticated PLM solutions. Bombardier saw IBM Global Business Services as the clear choice.

### **A foundation for shorter cycles**

Bombardier entered into a five-year agreement with IBM, under which IBM handles all aspects of Bombardier's PLM activities in the company's Canadian and U.S. aerospace operations. IBM's initial mission is to upgrade all of Bombardier's PLM systems to the newest version, a program known internally as the PLM V5 Foundation Project. IBM's activities range from deployment and configuration of the platform to ongoing management, support and personnel training. In addition to using the latest versions of CATIA and ENOVIA, the solution also employs IBM WebSphere® Message Broker and WebSphere Business Integration for SAP to integrate the PLM system with Bombardier's SAP ERP systems. To use the PLM solution, Bombardier's engineers are equipped with IBM IntelliStation® workstations.

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## **Key Components**

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### *Software*

- IBM WebSphere Message Broker
- IBM WebSphere Business Integration for SAP
- CATIA V5
- ENOVIA V5

### *Hardware*

- IBM IntelliStation workstations

### *Services*

- IBM Global Business Services

### *Timeframe*

- Five-year PLM Outsourcing Agreement
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## **Why it matters**

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As one of the first companies to outsource its PLM systems, Bombardier Aerospace has drastically cut the time and resources needed to ramp up for new aircraft programs. This, in turn, has strengthened Bombardier's ability to focus on developing innovative aircraft programs, the company's prime source of competitive differentiation.

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A longer-term byproduct of the agreement was the creation of an IBM PLM Centre of Excellence in Montréal, of which Bombardier is the first customer. In addition to providing the framework through which IBM will be delivering its expertise, the Centre also serves as a broader resource for the many aerospace companies and suppliers operating out of the Montréal area. The main force behind the creation of the Centre, Bombardier will also be a direct beneficiary because its many Montréal-based suppliers and partners will now have easier access to PLM solutions. In this way, Bombardier expects the IBM PLM Centre of Excellence to engender a higher degree of collaboration, efficiency and innovation within its circle of suppliers and partners.

### **Benefits of managed PLM take wing**

The benefits of Bombardier's new PLM strategy were clearly evident in the launch in February 2007 of the company's newest regional jet, the 100-seat CRJ1000 aircraft. One of the main engineering challenges of the CRJ1000 aircraft program was the need to redesign the aircraft's wing. This, in turn, required Bombardier to reprogram the complex, zero-tolerance machine tools that are used to manufacture the parts that make up the wing. By taking advantage of the advanced features of the latest Dassault Systèmes PLM solution, the company reduced the time required to machine its new parts for the CRJ1000 by 40 percent.

By placing its trust in IBM's expertise and unparalleled PLM track record, Bombardier was assured of extracting the maximum benefit of using PLM in its design process. Just as important—says Jocelyn Gauthier, IT director, Engineering & Supply Chain—is the fact that the solution was there when Bombardier needed it. “Bringing new planes to market faster is a key challenge facing all aerospace companies,” says Gauthier. “By taking an out-of-the-box approach to PLM, we're able to meet even the most demanding delivery schedules. IBM's experience was a critical part of our success.”

### **For more information**

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3-08  
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