Chengdu Aircraft Industrial
Digital aircraft development with CATIA and DELMIA

Overview

■ Challenge
Chengdu Aircraft Industrial needed to improve its commercial aircraft development technology and processes to compete with strong international rivals

■ Solution
Chengdu adopted 3D digital mock-up technology and a platform for concurrent engineering based on CATIA and DELMIA

■ Benefits
Chengdu has reduced development time by as much as 50%, implemented concurrent engineering for design and manufacturing, and reduced manufacturing costs

Chengdu - A leading manufacturer in China’s aerospace industry
Founded in 1956, Chengdu Aircraft Industrial (Group) Co., Ltd. of China Aviation Industry Corporation, is a major player in the design and manufacture of military aircraft in China. With 14,000 employees, it is also a leading developer of civilian aircraft and other industrial products for the Chinese aerospace industry.

As a technology leader in China, Chengdu Aircraft Industrial has used digital product development since the mid-1980s for both R&D and manufacturing processes. The company has collaborated with Boeing, Airbus, Dassault Aviation and other international aircraft manufacturers. Chengdu is currently developing and producing a Boeing 787 rudder and China’s ARJ21 domestic regional aircraft.

International market competition brings new challenges
Globalization has forced domestic aerospace companies such as Chengdu to compete and cooperate more actively in the global marketplace. And while still a national company, Chengdu also faces considerable pressure from competitors in the international civil aircraft arena.

“Commercial aircraft development in China has had a weak base and a slow start, and has been lagging behind military aircraft development,” said Luo Ronghui, President and General Manager of Chengdu Aircraft Industrial. “Domestic commercial aircraft development trails behind international best practices in areas such as airworthiness standards, machining, systems, and special materials. At the same time, we are up against strong competition from Boeing and Airbus on large airplanes, and from Raytheon, Bombardier Aerospace, and Dassault Aviation in the regional aircraft market.”

“Digital Chengdu” relies on CATIA and DELMIA
Chengdu’s decided to refocus its activity by reassessing its tools. Its two-fold goal was to promote the company’s aircraft making activities and organizational improvements

Luo Ronghui, President and General Manager of Chengdu Aircraft Industrial
made over the years, as well as to enhance development processes in order to achieve maximum product quality.

“We realized that we needed to reduce development time and improve enterprise R&D, manufacturing, and management-level processes”, said Ronghui. “Boosting the digital technology applications within the enterprise is not only important for improving competitiveness, it’s also a prerequisite for implementing the strategies of the China Aviation Industry Corporation for Chengdu.”

“We chose CATIA and DELMIA from Dassault Systèmes for 3D digital mock-up technology in design, process, and manufacturing, and also because CATIA has powerful aircraft-dedicated applications making it the de-facto standard in the aerospace industry,” said Song Chengzhi, Director, Deputy General Manager and Chief Designer at Chengdu. “To compete in this industry, Chengdu needed a unified platform for communicating with international aviation companies.”

“Chengdu and consulting specialists from Dassault Systèmes integrated our best practices in CATIA and additional developments were also implemented with DELMIA,” said Ronghui. “The integration of digital mock-up technology between CATIA and DELMIA, coupled with Chengdu’s technical knowledge and management processes, have drastically improved our R&D efficiency and reduced aircraft product development cycles,” said Ronghui.

“Before, we were confronted with problems due to interferences, collisions, and incompatibility between parts which we detected during the actual assembly process, resulting in repetitive product design, tooling repairs, and delays in the overall process,” said Ronghui. “Since Chengdu adopted DELMIA in May 2005, we have considerably reduced our costs, shortened our manufacturing cycles and improved our tooling process thanks to virtual simulations based on digital mock-ups.”

**Chengdu benefits from concurrent engineering**

“Thanks to CATIA for design and DELMIA for process and tooling, Chengdu has implemented a working platform where engineers work in a concurrent engineering environment,” said Song Chengzhi. “Everyone involved in a project can now work concurrently to identify problems in the manufacturing process early on during product design, significantly streamlining development and reducing time and costs.”

“Today, we spend only 23 months for the design and development of a plane model that once required four years or more to complete in our traditional development environment,” said Luo Ronghui.

Chengdu will continue to implement its “Master Plan for Digital Chengdu Construction” with projects such as an enterprise-wide digital support platform, security and protection systems, computer-aided 3D process planning and simulation systems, and a manufacturing implementation system. Chengdu also plans to broaden its collaboration with Dassault Systèmes to facilitate its ongoing digital transformation based on DS solutions.

“Chengdu has invested more than 20 years in building its information and technology environment and we are committed to further developing our use of advanced digital technology to reinforce our growth,” said Ronghui.

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Song Chengzhi, Director, Deputy General Manager and Chief Designer at Chengdu Aircraft Industrial (Group) Co., Ltd

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