

TRANSPORTATION AND MOBILITY CASE STUDY
ASHOK LEYLAND



Challenge:

Automotive OEM Ashok Leyland needed to speed delivery of commercial vehicles tailored to changing market needs with more thorough cost management.

Solution:

The company chose Dassault Systèmes' 3DEXPERIENCE platform, including its industry solution experiences such as *Target Zero Defect* and *Modular, Glocal & Secure* for modular vehicle design, validation, production, and configuration management.

Benefits:

The 3DEXPERIENCE platform's configured-to-order approach, collaborative capabilities, virtual analysis and simulation features help the company to fulfill its objective to increase product diversity while significantly reducing development time and costs.

"GREASING THE WHEELS OF THE WORLD'S ECONOMIES"

Vehicles produced by India's Ashok Leyland transport 70 million people in the country every day. The automotive OEM established 67 years ago is now the country's second largest commercial vehicle manufacturer and the fourth largest bus manufacturer in the world. "Our technical center started out as a small testing company and since then has grown into an R&D and multi vehicle-testing facility spread over a 100-acre campus with 1,200 engineers," said Dr. N. Saravanan, Senior Vice President and Head of R&D, Ashok Leyland Ltd. "Today Ashok Leyland helps keep the wheels of many of the world's economies turning."

India's automotive industry has gone through many changes over the years. In 2015 it is the fourth largest automotive market by volume and is expected to become the third largest by 2016*. Today, the country has nine commercial vehicle manufacturers. "The biggest difference between Ashok Leyland and other OEMs in India is that we are the country's only independent commercial vehicle manufacturer," Dr. Saravanan said. "Every other OEM works with third parties from which they can choose the technology and skills they need. We, on the other hand, are self-sufficient and our challenge is to remain independent while meeting the requirements of our customers."

ECONOMIC CYCLES FORCE COMPANIES TO ADAPT

From a business perspective, India's market can be characterized as cyclical and every three years there is an economic upturn followed by a sharp downturn, according to Dr. Saravanan. "In this cyclical context, you need to be able to adapt your production accordingly," Dr. Saravanan said. "We are recognized for our ability to release a wide variety of products, which not only helps us deal with India's market fluctuations, but also differentiates us from our competitors because our customers know they have choice with Ashok Leyland."

As customer expectations increase Ashok Leyland's engineers need to accelerate new product development (NPD) to produce new vehicle variants. "What was previously a two to three-year development cycle has now been reduced to approximately one and a half years. This is primarily because customers expect something new more often and if we don't deliver what they want, the competition will."

CONFIGURE TO ORDER WITH A MODULAR APPROACH

Producing many variants, however, rapidly became unsustainable and complex to manage. "To address this challenge, we are planning to implement a modular approach to vehicle design to enable us to meet our customers' requirements and to do so at the right cost and quality," Dr. Saravanan explained. "But we needed the right tools to support this effort, which is why we chose Dassault Systèmes' 3DEXPERIENCE® platform as the foundation for our modular approach."

Ashok Leyland selected two industry solution experiences: *Target Zero Defect* for first-time-right product development and *Modular, Glocal & Secure*, which specifically addresses the vehicle modularization process. "We were particularly impressed with the 3DEXPERIENCE platform's configured-to-order approach and its configuration management features, which help us to increase the diversity of our product portfolio while decreasing the number of managed parts. This significantly reduces development cycle time and accelerates delivery of the right products to our customers."

More diversity, however, means engineers must be able to efficiently handle additional customer needs generated by these variants. "Once the vehicle is launched, we receive a lot of additional customer requests which in turn results in more variants," Alfred Nixon, General Manager of Product Development said. "The configuration approach of *Modular, Glocal & Secure* helps us generate a 150% BOM (bill of materials) that includes all variant characteristics and functional requirements enabling our designers to make changes and to rapidly build a new variant."

The fact that data is centrally located helps streamline BOM creation as well. "Generating a bill of materials is fast since engineers can create it in their native CAD environment," S. Ramesh, General Manager IT said. "It is a foolproof process because the designer doesn't miss any part or assembly," S. Rajan, Assistant General Manager of Vehicle Architecture and Engineering Services added.

INNOVATIVE IDEAS TO INNOVATIVE PRODUCTS

Ashok Leyland believes innovation is encouraged if people at all levels have the tools and the opportunity to exchange ideas. "Social innovation is important to us because it allows our development centers across our five locations to easily collaborate and to transform ideas into successful products," Dr. Saravanan said.

"The social media applications of the 3DEXPERIENCE platform promote collaboration and innovation," Venkatesh Natarajan, Vice President and Group CIO added. "The 3DEXPERIENCE platform is remarkable from a business and user's point of view because it proposes virtual design and testing features that help our engineers easily test new ideas while compressing development cycle time and costs," he continued. "Dassault Systèmes' technologies are important for the digital transformation of Ashok Leyland because



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— Dr. N. Saravanan
Sr. Vice President and Head of R&D, Ashok Leyland

with the Internet of Things playing an increasingly major role in the automotive industry, they help us stay on the cutting edge of vehicle development. It is a true differentiator," Natarajan said.

Another benefit of the **3DEXPERIENCE** platform is data versioning. "Earlier we would have had several versions of the same component in different databases and when engineers wanted to find a particular part, they would spend more time searching for the latest version of this part," Ramesh said. "Now that all CAD models are stored in a centralized environment, we have a single source of the truth and people can rapidly find what they're looking for and are sure that the information is up to date."

Prior to implementing the **3DEXPERIENCE** platform, Ashok Leyland also worked with separate product development systems, one to create and manage CAD data and another to manage the product lifecycle. As they were not connected, people would have to manually push data from PDM into PLM. "Tightly linking CAD, PDM and PLM information under one roof with the unified **3DEXPERIENCE** platform reduces the IT-related effort needed to manage the different systems. Information flow is also seamless as data incompatibility is non-existent," Ramesh said.

Since Ashok Leyland does business globally in addition to its domestic market, its vehicles must comply with an increasing number of local and international regulations and crash tests. "With *Modular, Glocal & Secure*, we have powerful features that help us address all our regulation-compliance issues within the same consistent referential, the **3DEXPERIENCE** platform," Rajan said.

ZERO DEFECTS

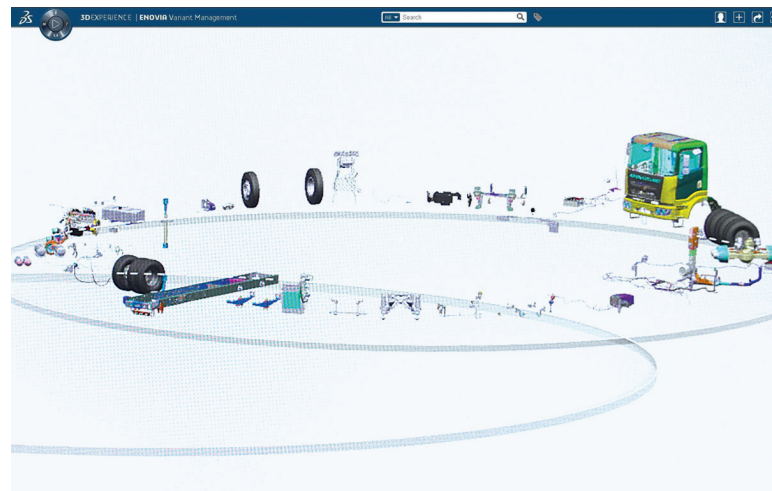
Ashok Leyland believes that market leadership begins with understanding the customer requirements and turning these requirements into products. "The **3DEXPERIENCE** platform enables us to have an integrated approach to addressing customer needs not only because it manages and capitalizes incoming requirements but because it also helps ensure that these requirements are satisfied at every phase of the development process," Dr. Saravanan said. "The **3DEXPERIENCE** platform essentially makes us more customer-centric because it helps to ensure the customer's interest is represented at all times. Moreover, thanks to *Target Zero Defect*, we can monitor the overall quality of a vehicle from ideation to manufacture in real time and deliver products at a fast pace with zero defects."

To develop products faster, Ashok Leyland leverages the power of virtual simulation to reduce the number of time-consuming physical prototypes. "Building physical prototypes is expensive and adds days and sometimes even weeks to our development process," Dr. Saravanan said. "Instead, we can use the **3DEXPERIENCE** platform's native and robust digital analysis and simulation applications to verify product integrity. With more virtual simulation we can easily test new ideas and deliver innovative products to market faster at less cost."

INDUSTRY SKILLS BEGIN AT SCHOOL

Maintaining a leadership position requires hiring the right talent with the proper skillset. "While there are many engineers graduating from Indian universities, not all of them possess the skills to be efficient from day one," Dr. Saravanan said. "I believe deeper academic-industry collaboration, during which students are trained on the **3DEXPERIENCE** applications, can be of tremendous help to our industry."

"Students have a lot to gain if they come out of school with an understanding of our workflow. For example, if they can acquire this knowledge by working on practical cases in colleges that cover an end-to-end automotive development process, their employability would improve," Ramesh added.



Top image: The Ashok Leyland 912 LE is a fully built light haulage truck used for carrying market loads.

The components of an Ashok Leyland truck are easily viewed in the **3DEXPERIENCE** platform.



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Vice President and Group CIO, Ashok Leyland

Focus on Ashok Leyland

Manufacturer of commercial vehicles, buses and trucks

Products: buses, trucks, light vehicles, specialized defense vehicles, engines

Employees: 11,204

Revenue: USD 3,3 billion (2014)

Headquarters: Chennai, India

For more information

www.ashokleyland.com

KEEPING KNOWLEDGE IN-HOUSE

In any company, employee turnover is a major challenge to retaining know-how, especially if this expertise is not documented. "When employees leave their company they take their knowledge with them," Ramesh said. "Now that data is managed in one platform it is no longer lost and everyone can easily find what they are looking for. Moreover, picking up where another employee left off is a delicate operation if processes are not defined and stored. With the **3DEXPERIENCE** platform's workflow management capabilities we can capitalize our product development workflows in the system so that others can benefit," he continued.

EXCITING PROSPECTS FOR THE FUTURE

Currently, the **3DEXPERIENCE** platform supports Ashok Leyland's development process from concept design all the way through detailed design, prototyping and manufacture. The company will eventually provide its manufacturing suppliers with access to its product data so that they can collaborate in real time with Ashok Leyland's production centers. "We find that the **3DEXPERIENCE** platform is a very strong collaboration platform," Natarajan said. "The ability to perform real-time simultaneous engineering opens up many possibilities. For example, by involving our suppliers at a very early stage of product development, we will considerably shorten cycle time and increase our competitiveness," he said.

Other future trends include using an online tool so that a sales engineer can configure a vehicle with the customer live. "It's very exciting to see the vehicle you want take shape before your very eyes. This is the type of experience we want to offer our customers," Ramesh said. "We also plan to do away with 2D assembly instruction drawings and instead deliver 3D models to our production sites. The objective is to facilitate comprehension and consequently accelerate vehicle production," Dr. Saravanan added.

For more than a decade, the Ashok Leyland-Dassault Systèmes relationship has flourished and transformed into a genuine partnership based on innovation, trust and a mutual understanding of the automotive industry's rising challenges. Dassault Systèmes Industry Services now plays a major role in implementing the **3DEXPERIENCE** platform and tailoring the system to Ashok Leyland's requirements. "They are helping us to migrate all our legacy CAD data into the **3DEXPERIENCE** platform without any data loss and with the same level of quality," Rajan said. "They also programmed our business process workflows in the system for us. Every step of the way, the Dassault Systèmes Industry Services team was and is a valuable asset to our implementation."

"Each industry has its own best practices and specific requirements, and Dassault Systèmes knows how we work and the way the automotive industry works in general," Ramesh added. "With the great products and detailed knowledge and experience of the automotive landscape they bring to the table, we expect our product development processes to improve and our products to improve as well, which will add value to our company's business."

Our **3DEXPERIENCE**® platform powers our brand applications, serving 12 industries, and provides a rich portfolio of industry solution experiences.

Dassault Systèmes, the **3DEXPERIENCE**® Company, provides business and people with virtual universes to imagine sustainable innovations. Its world-leading solutions transform the way products are designed, produced, and supported. Dassault Systèmes' collaborative solutions foster social innovation, expanding possibilities for the virtual world to improve the real world. The group brings value to over 190,000 customers of all sizes in all industries in more than 140 countries. For more information, visit www.3ds.com.



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