Autodesk: Solutions for the Auto Industry

CIMdata Commentary

Automotive industry manufacturers are well known for the adversities they face in the design and production of competitive products in their volatile consumer markets. They have, however, become known as leaders in innovative new product development. In particular, automotive OEMs set a forward looking example of excellence often emulated in other industries. The challenges the automotive sector confronts entail:

- Visual appeal with demands on mathematical, aerodynamic, and aesthetic disciplines
- Responding to increasing customer demands for personalization of “their” vehicle
- Product innovation and complexity across mechatronics systems of mechanical, electrical, and embedded software solutions
- Reducing cost through virtual simulation in numerous domains of structural, thermal, fluid dynamics, and injection molding
- Improved collaborative design, decision making and product visualization across the supply value chain
- Manufacturing agility with asset management, production layout and optimization

As a leading technology solution provider to product development companies, Autodesk has expanded their presence in the automotive industry based on growth through product enhancements and technology acquisitions. In doing so, they have emerged as a viable partner at the enterprise level. Large scale enterprises require a broad, effective suite of products that provide support throughout the full product development cycle from planning and conceptual design, through detailed design modeling and simulation, to manufacturing set-up and tooling. Uniting applications across these complex development and production processes necessitates strong collaboration tools coupled with solid data and workflow management capabilities.

Five Pillars of Strength

Autodesk has done due diligence in studying the automotive industry with regard to the numerous processes and technology used to develop automotive products. They are following a solution strategy that builds upon their traditional strengths by expanding their capabilities and through targeted acquisitions all the while gaining in expertise working with automotive companies in the supply chains of the major OEMs. Today they position themselves upon five pillars of strength, often with an acknowledged best in class solution, as they move forward to partner at the corporate level.

Conceptual design—Almost every new product development begins with an idea and a concept drawing of the envisioned product. This reaches its height in automotive design styling where hundreds of millions of dollars can ride on the success or failure of a new design. Autodesk Alias is the recognized best in class solution for conceptual modeling. Known for its rich class A surface technology and its impressive visualization capabilities, Alias has become an industry standard for professional industrial designers. Coupled with Autodesk's attention for interoperability with major CAD applications, the Autodesk applications for conceptual design offer solid solutions for any automotive enterprise.

Engineering design—Product definition reaches its full clarity in detailed engineering design. Design engineers must draw from an extensive suite of tools to articulate their

product designs. These tools need to be easy to use in order to deliver the productivity and innovation demanded by automotive manufacturers. Be it parametrically constraint driven or direct modeling, the designer looks for flexible workflows while management seeks the advantage of low total cost of ownership and efficient tools. Autodesk meets these challenges with their flagship Inventor design product. Add interoperability with Alias, 2D, and multi-CAD, and Autodesk offers enterprise level clients value-added solutions, together with integrated data management for workgroup productivity. Autodesk's long experience in the supply chain has allowed them to build effective and trusted interoperable solutions for companies that need to work with multi-CAD data coming from their many different partners and suppliers.

Simulation and analysis—Product evaluation in the virtual world provides both a major cost cutting opportunity in the product development process as well as an ability to develop more innovative products. The earlier in the product development process that simulation is deployed, the easier to make design changes and positively impact product cost and reliability. In addition, eliminating the need to do costly physical prototypes shortens the design delivery cycle and improves product quality and conformance to functional and requlatory requirements. Autodesk steps up to the challenge with their extensive simulation and analysis portfolio, which has grown over the past few years through an aggressive combination of acquisition, organic development and product integration. Autodesk is continuing to innovate and launch new offerings in addition to their current core offerings—Autodesk Moldflow, Autodesk Simulation CFD and Autodesk Simulation Multiphysics.

The automotive industry can particularly benefit from the applicability of Autodesk Multiphysics and CFD solutions to optimize thermal management of electrical components, hybrid-electric vehicle batteries, motor/generator components and other vehicle systems such as engine cooling. In addition, Moldflow's injection molding simulation can help enable major weight savings when coupled with innovative new materials ranging from long fiber thermoplastics to the introduction of new resin transfer based processes for low cost carbon fiber reinforced component manufacturing.

Collaborative visualization—Communication across diverse product stakeholders, including the supply chain, epitomizes enterprise level interaction. From supporting the product decision making process through real time visualizations to the final downstream production of broadcast quality marketing assets, Autodesk delivers best in class visualization solutions that make 3D models available to many different users. Beyond the collaborative solutions found in Alias and Inventor, Autodesk's deep involvement in the entertainment industry offers a continual stream of technology and capabilities such as those found in their 3ds Max Design and Maya solutions.

Manufacturing—The manufacturing equipment used to produce products, together with the plant buildings and manufacturing floor layout of the equipment, represent yet another important aspect of product development and delivery. Autodesk solutions have long been the tools of choice in the supply chain for equipment design and tooling. The lessons learned there in flexibility and cost-effective solutions now provide a foundation for Autodesk in their move into the full enterprise. In addition, Autodesk's presence in building information modeling (BIM) delivers added strength to their comprehensive solutions in manufacturing.

Autodesk's Factory Design Suite provides design, multi-CAD integration, review, visualization, and analysis of entire factory models. Combined with solutions for user customizable asset libraries and a cloud-based asset ecosystem, Autodesk solutions can help provide 2D and 3D interoperability for mixed design workflows on the production floor. They can also help companies perform facility layout optimization to get an early

understanding on waste in transportation, machine utilization, energy consumption and other factors that must be considered in designing, constructing, and operating their production facilities.

Autodesk 360

Spanning all these solutions, Autodesk's new PLM 360 cloud based platform provides companies a highly flexible workspace within which to collaborate using workflows that extend across the full partner enterprise and organizational boundaries. Autodesk has used their expertise gained in working with supply chain companies to create a pragmatic, cost-effective solution that leverages the accessibility, scalability, flexibility, configurability, and instant-on usability of the cloud. PLM 360 enables companies to continually maintain a single source of information and process management.

Of particular interest are Autodesk's initial offerings of mobile apps including viewing and editing of 2D and 3D design files using Autodesk Design Review and AutoCAD WS. For example, Autodesk Design Review allows users to access design files directly on their iPad, iPhone, or iPod touch with the ability to mark up drawings. As Autodesk moves forward expanding on their cloud based technology, it will be delivering solutions that include supply chain design collaboration, quality and warranty related processes, marketing visualization production and collaborative sourcing.

Summary

Manufacturers in the automotive industry demand extensive, highly capable product development tools and environments. Yet, at the core of all their requirements they look for scalability, flexibility, and cost-effective solutions that can be applied across their entire value chain. Autodesk applications have long been associated with value in the supply chain companies that feed automotive OEMs worldwide. Today, with Autodesk's strategic attention to adding best in class applications, many automotive OEMs are also finding their needed solutions in the Autodesk portfolio. Autodesk has indeed emerged as a viable partner at the enterprise level.

About CIMdata

CIMdata, an independent worldwide firm, provides strategic management consulting to maximize an enterprise’s ability to design and deliver innovative products and services through the application of Product Lifecycle Management (PLM). CIMdata provides world-class knowledge, expertise, and best-practice methods on PLM. CIMdata also offers research, subscription services, publications, and education through international conferences. To learn more about CIMdata’s services, visit our website at http://www.CIMdata.com or contact CIMdata at: 3909 Research Park Drive, Ann Arbor, MI 48108, USA. Tel: +1 734.668.9922. Fax: +1 734.668.1957; or at Oogststraat 20, 6004 CV Weert, The Netherlands. Tel: +31 (0) 495.533.666.