

## A N A L Y S T C O N N E C T I O N



*Joe Barkai*  
*Practice Director, Product Lifecycle Strategies*

## The Automotive Industry: New Complexities Demand Better Decision Making

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*In today's automotive industry, decision making is a multidisciplinary collaborative process, inclusive of all stakeholders, throughout the product life cycle. Consequently, one of the trends among automotive manufacturers is to open up and extend the product life-cycle management (PLM) environment throughout the enterprise. The increased pressures induced by the complexity of product development processes, supply chain planning, and sustainability imperatives drive automotive manufacturing companies to demand open and flexible systems that are capable of managing and sharing more than just design and engineering data. Automotive manufacturers need IT to facilitate connectivity, interoperability, and visibility to all interenterprise and intraenterprise information in order to improve data analytics and foster faster, better decision making.*

The following questions were posed by Siemens to Joe Barkai, practice director of Product Lifecycle Strategies research at IDC Manufacturing Insights, on behalf of Siemens' customers.

**Q. Following the economic crisis, what are the specific changes the automotive industry is undergoing?**

A. Manufacturers in the automotive industry, OEMs and suppliers alike, are under pressure to sustain profitability and, as the economy recovers, drive sustainable profitable growth. Manufacturers need to improve the top line by increasing revenue and reducing expenses in order to improve already razor-thin margins. North American and European OEMs are contending with eroding market share due to competition from traditional Asian manufacturers as well as emerging competitors from India and China. Along with emerging competitors, demand itself is shifting from North America and Europe to emerging economies such as India, China, Latin America, and even Africa. OEMs are looking for ways to exploit the new demand profitably; their suppliers must follow them.

Emerging economies offer opportunities for low-cost manufacturing. They increasingly develop engineering skills at lower costs. OEMs are establishing not only manufacturing centers but also design and engineering centers in remote geographies. Local presence in a growth region has additional benefits in reduced logistics costs and compliance and often helps with brand and market penetration.

In terms of technology, cars are becoming increasingly complex. There's a much higher density of software in their electronics, as mechanical systems are being replaced by software. The volume of software code and distributed functionality it controls in the vehicle today creates a new set of challenges for OEMs. Another area that drives complexity from a design perspective is increased regulatory pressure to reduce pollution and to improve safety standards. And, of course, new technologies — hybrid cars, plug-in electric cars, and so on — are affecting traditional OEMs.

So what we see is an increase in both technological and operational complexity. Coupled together, the changes challenge some of the traditional methods of developing and manufacturing vehicles.

**Q. What should OEMs focus on in order to address these challenges?**

- A. The changing nature of technologies and operations has a tremendous impact on the complexity of decision making. Decisions require a broader set of communities, both inside and outside the enterprise, to work collaboratively and cohesively. However, those communities have much less ability to collaborate efficiently and to make better decisions due to added complexity. Product-related decisions are multidisciplinary and must represent the needs and business drivers of multiple stakeholders, such as engineering, supply chain, manufacturing, compliance, and numerous others.

OEMs and suppliers must ensure that they have the necessary information to make the right decision with high levels of precision and certainty. What's needed is a way to synthesize various views and different perspectives, inside and outside the enterprise as well as among supply chain and dealer channels, which, in turn, facilitates effective collaboration and improves the accuracy and timeliness of decision making.

However, such a comprehensive view is not always easy to realize. As the network of design partners, suppliers, and manufacturing facilities grows, the number of different tools, file formats, and IT standards also grows. This environment prevents the various stakeholders in different functions and locations from having a consistent and reliable view of information, which, in turn, prevents them from having a complete, accurate, and timely context for making decisions. As a result, stakeholders are unable to understand the impact that individual decisions have on the design, supply chain, or manufacturing. For example, what effect does a decision made in design have on the ability to manufacture a certain subsystem in a remote location or the ability of a service technician to access a part for repair?

**Q. Does this mean that tighter integration between systems is needed? Does such a tightly integrated environment demand rigid standardization of data, methods, and tools?**

- A. Tighter integration is absolutely needed. Unfortunately, it's not practical to demand that IT systems be standardized across manufacturers and their suppliers and design partners. Currently, OEMs use a multitude of tools in areas such as CAD, CAM, costing, supplier scorecards, and analytics. Some tools may adhere to standards and others may not, yet they are considered "best in class." Still other tools are homegrown. This is true in many industries and especially in the automotive industry, which on the one hand has a very long history and yet is evolving rapidly. This proliferation of standards, by the way, puts an additional burden on suppliers that must satisfy the IT standard requirements of multiple OEMs.

To improve consistency of and access to product-related information, OEMs need to establish an open system in order to facilitate collaboration with internal stakeholders as well as external partners. Systems must be able to support multiple communities of practice,

including their workflows, tools, and methods. OEMs may want to standardize processes and methods and yet allow for necessary local variances to support local regulation, skill set, level of automation, and so forth.

This environment is predicated upon a product data management system to provide a single unified view of the various disciplines and different aspects of the product as required by the various stakeholders. In effect, a centralized product data management system can synthesize data from other systems and thereby can improve collaboration and result in better reporting, dashboards, and analytics that will drive better decision making among the various stakeholders.

**Q. What is the role of standards in achieving this?**

A. Because OEMs use a multitude of tools in areas such as CAD, CAM, costing, supplier scorecards, and analytics, many OEMs rely on translators and conversion software. However, these tools and processes are often considered imperfect solutions to the problem.

The changes the automotive industry is undergoing will certainly drive increased standardization, but this should be organic rather than disruptive. A more practical strategy for OEMs is a hybrid approach: an enterprisewide platform that is open and flexible enough to accept other standards — to accept a range of information from different tools and then synthesize that data to allow others to view relevant information. When choosing a standard, manufacturers should focus on one that is open and scalable. That means the standard should obviously support CAD (geometric data and metadata) and be open to include nonshape data (e.g., supplier information).

**ABOUT THIS ANALYST**

*Joe Barkai is practice director for IDC Manufacturing Insights' Product Lifecycle Strategies research service. In this role, he examines discrete manufacturing industries that include automotive, aerospace, industrial equipment, and other complex, mission-critical capital equipment to identify business imperatives, best practices, and emerging technologies. His research topics center on effective product life-cycle management and include innovation, design and engineering, service and warranty, and product end of life.*

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Global Headquarters: 5 Speen Street, Framingham, MA 01701 USA P.508.872.8200 F.508.935.4015 [www.idc-mi.com](http://www.idc-mi.com)