

## Promoting Product Development Efficiency for Automotive Goods

Data from Aberdeen Group's December 2007 *Product Innovation Agenda 2010* study found that automotive manufacturers' product development goals are equally focused on the top and bottom lines. Automotive manufacturers report more attention to cost reduction than their peers in all other industries. However, there is a recognition that corporate growth lies in bringing innovative products to market ahead of the competition. But how can this be done in an industry where competition is fierce, customer's demand high quality at low prices, and supply chains are vast and complex?

### Goals for Product Development

Improving product profitability is on the top of the executive agenda for automotive manufacturers (Table 1). These companies are feeling equal pressure to grow revenue and lower product costs. This is unlike other industries, which are more focused on growing revenue than they are on lowering product costs. Automotive manufacturers report a greater focus on lowering product development costs.

Given the automotive sector's comparatively lower performance in hitting revenue and cost targets (Figure 1, below), it makes sense that they report a great deal of focus on improving both top and bottom lines. In the past, US OEMs were affected by quality issues which drove down prices. This has forced them to focus on lowering their costs, which in turn affects suppliers, which must also focus on lowering costs.

**Table 1: Goals for Product Development**

"A lot of emphasis" on:	All Respondents	Automotive
Increase product revenue	82%	67%
Decrease product cost	60%	67%
Decrease product development cost	36%	46%
Increase value of intellectual property	36%	41%
Decrease corporate risk	36%	37%
Decrease product lifecycle cost	29%	35%

Source: Aberdeen Group, December 2007

### Challenges

The challenges automotive companies face are similar to those reported by other industries, with some variation in priority (Table 2). Given the greater

#### Sector Insight

Aberdeen's Sector Insights provide strategic introspective and analysis of primary research results by industry, market segment, or geography

#### Sector Definition

For the purposes of this study, respondents who indicated that they operated within the automotive industry were isolated and aggregated for comparison against peer manufacturers across industries in Aberdeen Group's performance framework. Respondents are primarily tier one and tier two automotive suppliers, rather than OEMs.

The majority (69%) of these manufacturers are located in North America, with the remaining respondents split between Europe (12%), Asia (15%), and other areas of the world (4%).

focus on bottom line goals, it should come as no surprise that automotive manufacturers report price pressures from customers and sales channels as their top challenge. And while this is true across industries, automotive companies report it with even greater frequency than their peers.

**Table 2: Challenges for Product Development**

	All Respondents	Automotive
Price (cost) pressure from customers or sales channels	53%	62%
Globalization of markets and / or supply chains	25%	49%
Short windows for new product introduction	41%	42%
Market demand for increased quality / reliability	22%	28%

Source: Aberdeen Group, December 2007

This is consistent with the product development goals these companies report, which also found that while the pressure to lower prices is high for all industries, it is even more acute for the automotive industry.

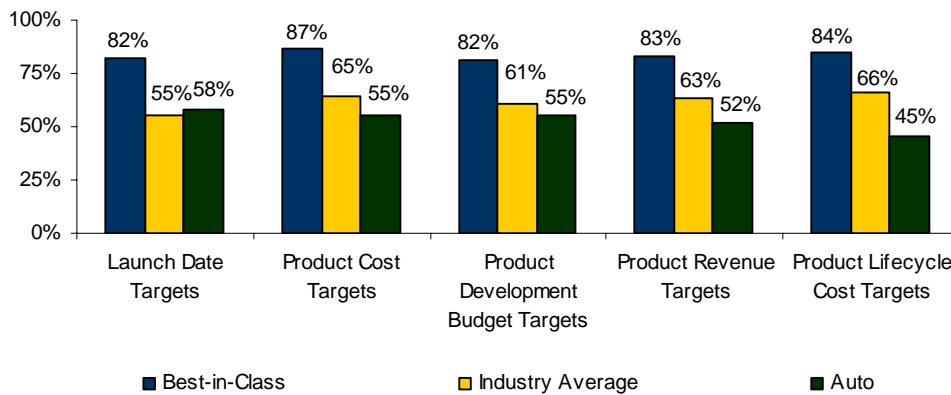
Globalization is also a larger issue for the automotive industry than it is for other industries. This may be related to the competitive pressures forcing automotive companies to seek global suppliers in an effort to lower costs. It may also be simply the tactical challenges of managing and coordinating a complex design chain.

The third highest challenge reported by automotive companies is the short window for a new product introduction. While they report this as a challenge about on par with their peers in other industries, the performance of other industries (Figure 1) suggests that they have done a better job of addressing the problems associated with shortening development cycles. Automotive companies report that they meet product launch dates 58% of the time, which is above average, but leaves the opportunity for improvement. Finally, market demand for higher quality is high for automotive manufacturers (and higher than it is for other industries); however, it remains a distant fourth when compared to the top three challenges.

## **Aberdeen Analysis**

Balancing product performance with streamlined development processes is not accomplished easily. With such significant challenges to overcome, it is understandable that Aberdeen Group's December 2007 [Product Innovation Agenda 2010](#) report found the performance of automotive manufacturers is slightly behind the Industry Average across key product development metrics that drive profitability (Figure 1).

**Figure I: Performance Framework**



Source: Aberdeen Group, December 2007

Automotive companies' focus on speed appears to be making an impact, as they are hitting their launch target dates slightly ahead of the average rate of other industries. However, they lag when it comes to meeting revenue and product lifecycle cost targets. In part, this may be a result of sacrifices these companies are making to hit launch dates that have a negative effect on revenue and lifecycle costs. The difficulty in meeting lifecycle costs may be because quality is sacrificed in an attempt to meet launch dates. Lower quality will drive up warranty and service costs.

## Opportunities for Automotive

To improve their performance in these areas, automotive manufacturers can look to the steps the Best-in-Class have taken to improve the efficiency of their product development processes. These steps include the adoption of a number of capabilities that can streamline product development and help the Best-in-Class achieve the performance lead they currently hold. Many of these are also capabilities that automotive companies plan to adopt in the coming years as part of their strategic initiatives.

### Product Innovation

Research from Aberdeen's *Product Innovation Agenda 2010* report found that automotive suppliers are not especially focused on innovation, falling behind the Industry Average in most of the capabilities that differentiate Best-in-Class performance (Table 3). Currently, Best-in-Class and Industry Average companies are focused on leveraging related innovations (patents) and put a chief product innovation officer in place. These are important differentiators of Best-in-Class performance. However, automotive companies fall behind the Industry Average when it comes to the adoption of open innovation and the identification of process owners for the innovation process.

These are areas that enable the Best-in-Class to transform innovation into a formal, repeatable process. To this end, these performers are 1.7-times as likely as automotive manufacturers to identify a process owner for innovation. They are also three-times as likely to adopt open innovation

processes. Open innovation broadens the available channels of new product ideas to resources outside the four walls of the enterprise, including customers, partners, and other external entities such as academics and researchers in other industries. With more sources for innovative ideas, effectively, this means that an enterprise is better positioned to select the best innovation that will be the most successful in the marketplace.

The automotive sector is anticipating growth in these areas, with the top growth areas for these companies revolving around: transforming innovation into more of a measurable process, embracing open innovation, and designating a process owner for innovation. In particular, putting an executive-level position in charge of innovation is something Best-in-Class are doing and is an area automotive could benefit from. While it is a top innovation focus for these companies presently, these companies report less focus on it as a growth area.

**Table 3: The Competitive Framework - Product Innovation**

	Best-in-Class 2008	Industry Average 2008	Automotive		
			2008	2010	Growth
Measure innovation performance with formal metrics	36%	22%	27%	68%	152%
Open innovation processes	72%	31%	24%	52%	117%
Process owner for the innovation process	68%	49%	39%	70%	79%
Ability to retrieve and leverage related innovations (patents, etc.)	70%	53%	43%	74%	72%
Chief Product / Innovation Officer or equivalent executive responsible for product innovation	54%	35%	44%	56%	27%

Source: Aberdeen Group, December 2007

### Product Development

Automotive companies are also somewhat behind the Industry Average in most areas of product development (Table 4). Currently, one of the top areas of focus for automotive companies is the adoption of a formal feedback process from suppliers and contract manufacturers. They exceed the Industry Average here, which reflects the important role suppliers play in the design process for OEMs.

While it's an area where automotive companies lag behind the Industry Average, centralization of product development decisions sees a great deal of focus among automotive manufacturers. This is an important area for automotive manufacturers. As they get feedback from multiple sources, they need to make sure that the individual responsible for making the final call is clearly identified. Centralization is also an area where automotive manufacturers anticipate a great deal of growth. Seventy-four percent (74%) of these companies report that they expect to have adopted the capability by 2010. This is likely driven by their focus on speed and efficiency.

“By sharing our 3D design data with suppliers in secure formats, we can get quotes back within a day. Rather than wasting time dimensioning a 2D drawing, plotting it, sending it out, and waiting for a response we can quickly send out the 3D data and continue to focus on our design work. This quick turnaround expedites the entire process.”

~ Vince Kirchner  
CAD Systems Administrator  
Guardian Automotive  
Products, Inc.

The highest growth area for automotive manufactures is the use of formal metrics to drive continuous improvement. Adoption is expected to rise from 22% to 79% by 2010, a growth rate of 259%. Measurement helps to identify where steps can be take to improve efficiency. The ability to capture those metrics is also a high growth area, with adoption expected to rise from 23% to 73% by 2010.

**Table 4: The Competitive Framework - Product Development**

	Best-in-Class 2008	Industry Average 2008	Automotive		
			2008	2010	Growth
Product development metrics used to drive continuous improvement	48%	29%	22%	79%	259%
Formal knowledge capture and reuse strategies	52%	27%	23%	73%	217%
Measure performance of product development with formal metrics	48%	35%	33%	87%	164%
Implement Lean product development concepts	48%	18%	27%	66%	144%
Different product development processes by the type of project	50%	33%	25%	54%	116%
Formal feedback process from suppliers / contract managers	48%	25%	37%	74%	100%
Centralized or coordinated product development decisions across the enterprise	76%	45%	37%	74%	100%

Source: Aberdeen Group, December 2007

### Product Design and Engineering

Automotive manufacturers most resemble the Industry Average in design and engineering capabilities (Table 5). Currently, their top area of adoption is digital simulation, which is related to lowering costs. By looking for ways to predict product behavior virtually, companies can often resolve issues before bearing the cost of building physical prototypes. Centralized product data is also high for automotive manufacturers, with 53% of automotive manufacturers currently reporting that they centralize product data, and nearly 100% projecting that they will adopt this capability by 2010.

Other areas of growth reported by automotive companies largely involve the integration engineering and manufacturing with the digital simulation and prototyping of manufacturing processes as the top area of growth. Similar to digital prototypes of products, simulating manufacturing processes can help to reduce cost and improve efficiency. To get more accurate predictions of what will happen in the real world; automotive manufacturers are providing simulation tools to the engineers as opposed to leaving it a separate function. This means that engineers can do more, earlier, and with a more specific focus in mind.

Other growth areas are largely focused on enabling collaboration with manufacturing and suppliers. This includes formal processes for feedback, design processes, simulation of manufacturing processes, and providing more visibility to manufacturing, all of which show high growth

"We send digital models to the customers we are working with to obtain feedback on how the product looks. There tends to be more iterations in the design phase as the customer wants the product to look like a work of art."

~ Engineering Manager  
Automotive Supplier

expectations. Improving collaboration between departments and across the supply chain can be beneficial to the engineering organization, both in terms reduced costs of as well as improved efficiency in hand-offs between stakeholders.

**Table 5: The Competitive Framework - Engineering**

	Best-in-Class 2008	Industry Average 2008	Automotive		
			2008	2010	Growth
Digital simulation and prototyping of manufacturing processes	40%	28%	25%	85%	240%
Formal feedback process from supplier / manufacturers	58%	39%	27%	70%	159%
Formal collaboration processes	56%	37%	35%	84%	140%
Visibility to supply / obsolescence implications of decisions	54%	28%	27%	64%	137%
Integrating product design with manufacturing process design	60%	54%	38%	84%	121%
Visibility to requirements and constraints during design process	72%	53%	43%	82%	91%
Centralized product data	63%	49%	53%	98%	85%
Visibility to Manufacturing feedback / experience in design process	72%	46%	48%	81%	69%
Digital simulation and prototyping of products	80%	54%	54%	85%	57%

Source: Aberdeen Group, December 2007

## Technology Investment Areas

In addition to the capabilities discussed thus far, a crucial differentiator of Best-in-Class performance is the deployment of Product Lifecycle Management (PLM) applications. Fifty-eight percent (58%) of Best-in-Class performers report that they have adopted PLM (compared to 31% of the Industry Average). PLM provides a central location for data and automates a number of development processes; helping improve time to market as well as containing costs.

It is not surprising, then, that the adoption of PLM is an area that automotive manufacturers project as a top technology growth area. While 29% of automotive companies currently report that they use PLM, 75% expect to adopt PLM by 2010. PLM is the second-highest technology growth area reported by automotive companies. In fact, PLM shows such broad adoption by 2010, with a majority of both the Best-in-Class and Industry Average using it, that it may cease to be a performance differentiator and become simply a prerequisite for remaining competitive.

Expanding from PLM, then, will be critical in continuing to improve and support speed and efficiency of product development. Table 6 lists the top 10 technology growth areas for automotive companies. The top area is Digital Rights Management (DRM) software, which is consistent with all

industries. DRM solutions help to protect product Intellectual Property (IP), which is of particular concern with outsourced design data. While only 10% of automotive companies currently have DRM, as many as 42% will have it in the next two years, a rapidly emerging trend. There is also a lot of growth in involving manufacturing organizations. The next two growth areas are focused on the integration with manufacturing process planning, both digital manufacturing process simulation and digital manufacturing process planning.

**Table 6: Top 10 Innovation Technology Investments 2008-2010**

	Currently Use	Plan to Adopt by 2010	Growth 2008 - 2010
Digital Rights Management (DRM)	10%	42%	320%
Product Lifecycle Management (PLM) defined as PDM with integrated business processes	29%	75%	159%
Digital manufacturing / manufacturing process simulation	24%	62%	158%
Digital manufacturing / manufacturing process planning	29%	70%	141%
Business Intelligence (BI) / analytics	29%	70%	141%
Advanced search capabilities	31%	74%	139%
Risk management	33%	71%	115%
Obsolescence management	27%	57%	111%
Recipe / formula management	19%	38%	100%
Manufacturing Execution Systems (MES)	31%	58%	87%

Source: Aberdeen Group, December 2007

## Required Actions

Automotive manufacturers report equal priorities around increasing product revenue and decreasing product costs. While they've taken a number of strides toward adopting formal processes and measuring performance, they retain an unfocused approach to innovation and often fall behind the Industry Average. As they continue to adjust their programs, these companies should look to the following steps:

- **Invest in PLM.** PLM will become commonplace in 2010 meaning it will become less of a competitive differentiator. Seventy-five percent (75%) of automotive manufacturers plan to adopt PLM in the next two years, and those without it will be at a competitive disadvantage. PLM supports many automotive companies' initiatives and plans for 2010 to centralize data, support collaboration with suppliers and manufacturing, and automate business processes - all of which will help accelerate the development process.
- **Stay abreast with new processes.** The Best-in-Class are three-times as likely as automotive manufacturers to adopt open innovation strategies and 1.8-times as likely as automotive companies to adopt Lean product development.

- **Leverage existing information assets for knowledge capture and reuse.** The Best-in-Class are twice as likely as automotive companies to have formal capture and reuse strategies in product development. Effective reuse of existing knowledge can help lower costs as well as improve efficiency.
- **Extend visibility to the impact of engineering decisions.** This is an area where many automotive manufacturers plan to invest, and is one that is currently a major differentiator of Best-in-Class performance. The Best-in-Class are 2.1-times as likely as automotive manufacturers to enable formal feedback from suppliers and 1.5-times as likely to enable visibility into the impact design decisions have on the manufacturing organization. This kind of visibility can go a long way to help eliminate unnecessary costs as well as to better take quality issues into consideration before making decisions.
- **Put DRM in place to protect IP.** Only 10% of automotive manufacturers currently have invested in DRM applications. Even if these companies follow through on the high growth projected only 42% will have adopted DRM by 2010.

For more information on this or other research topics, please visit [www.aberdeen.com](http://www.aberdeen.com).

#### Related Research

[Product Innovation Agenda 2010](#);  
December 2007

[The Lean Product Development Benchmark Report](#); May 2007

[Global Design Strategies in the Automotive Industry](#), April 2008

[Configuration Management for Aerospace and Defense](#); December 2007

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