

April, 2008

Global Design Strategies in the Automotive Industry

Global design strategies have matured significantly over the last two years. Aberdeen Group's December 2005 *Global Product Design Benchmark Report* found that 79% of study participants were turning to global design chains in order to reduce costs. Aberdeen revisited the topic in October 2007 for the report *Profitable Design Chains: Global Product Design Comes of Age*, and found the weight from cost pressures has reduced significantly (46% of respondents), while market demand for rapid product development (47%) has risen to the top pressure. Manufacturers operating within the automotive sector indicate the same top of mind concerns, but with a lingering bias towards cost pressures (54% of automotive respondents) over the need to develop products more quickly (43%).

Aberdeen Analysis

With two top American automotive OEMs reporting record losses within the last year, it makes sense that automotive manufacturers report a greater focus on lowering costs. Additionally, automotive suppliers feel a lot of pressure to lower costs as they compete against each other for OEM business. This tension is also reflected in the greater focus automotive manufacturers have on corporate demands to grow revenue (29%) compared to all respondents. The importance of innovation has been driven home for automotive manufacturers recently as well, as new innovations such as hybrid vehicles have captured market share.

To gain an understanding of how manufacturers' can best take advantage of global design chains, Aberdeen Group examined the global design strategies of more than 170 enterprises during September and October 2007. Respondents were benchmarked according to their performance across five key performance indicators and divided among three performance categories: the Best-in-Class (top 20% of performers); Laggard organizations (bottom 30%), and the Industry Average (the remaining 50%). These measures included the percent of products meeting targets for revenue, cost, product launch, quality, and overall product development costs. Automotive manufacturers perform about on par with the Industry Average of manufacturers across all industries in each measurement, with the exception of product revenue targets (Figure 1).

Sector Insight

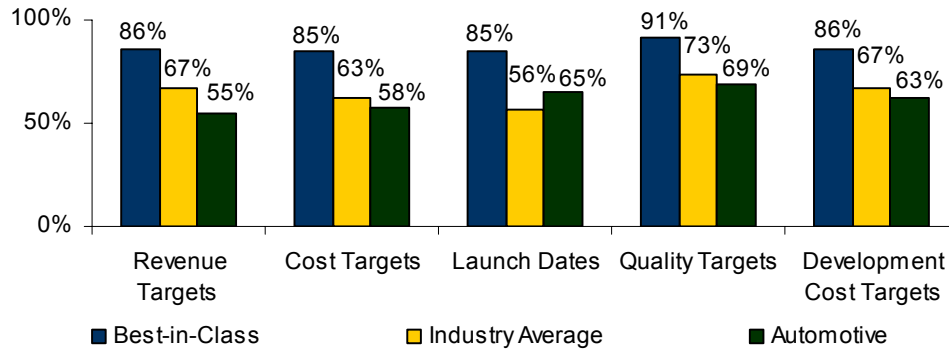
Aberdeen's Sector Insights provide strategic introspective and analysis of primary research results by industry, market segment, or geography

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.

A slim majority (59%) of these manufacturers are located in North America, with the remaining respondents divided between Europe (14%) and Asia (28%).

Figure I: Performance Framework



Source: Aberdeen Group, October 2007

The Competitive Framework Key

The Aberdeen Competitive Framework defines enterprises as falling into one of the three following levels of practices and performance:

- Best-in-Class (20%)* — practices that are the best currently being employed and significantly superior to the industry norm
- Industry Average (50%)* — practices that represent the average or norm
- Laggards (30%)* — practices that are significantly behind the average of the industry

It is not surprising that meeting revenue targets is the area where automotive companies show the greatest performance differentiation compared to the Best-in-Class given reports of record losses by some OEMs. As the OEMs struggle to meet their revenues, suppliers are forced to lower their prices cutting into their revenues. As US automakers lose market share, they need less from their suppliers, which hurts their revenue streams as well.

On other measures, automotive manufacturers indicate roughly Industry Average performance. One area where they exceed the Industry Average is meeting product launch dates. Achieving faster product development processes is the top pressure driving companies to adopt global design strategies, and the paths automotive companies are taking are helping them beat the average of their peers in other industries.

Strategic Actions

The strategic actions that automotive manufacturers report taking as part of their global design initiatives are directly tied to their top pressures (Table I).

Table I: Top Strategies of Global Design

Strategic Actions	Auto	All Respondents
Leverage high talent, low cost design resources from global workforce	56%	51%
Acquire knowledge of local markets and regulations	30%	22%
Increase design capacity beyond currently available local resources	30%	32%
Access new sources for product innovation outside the company	30%	28%

Source: Aberdeen Group, October 2007

With cost top of mind for these companies, they are taking advantage of the different labor costs around the globe. This is tied to the traditional cost advantages of global product development and is about on par with their peers in other sectors. However, this is also tied to the need for rapid product development. Automotive manufacturers also report that they are attempting to increase design capability beyond local resources as well as acquire new sources for innovation available outside of the company. Both of these initiatives are tied to the availability of a global workforce. The [Profitable Design Chains](#) report found that while global product development was originally about reducing the cost of product development, companies are beginning to recognize more strategic benefits.

However, the secondary pressures indicated by automotive manufacturers show a focus on growing revenue. In particular, where these companies stand out from their peers in other industries is by attempting to leverage global product development initiatives in a way that allows them to acquire knowledge of local markets and regulations. While this was the second highest action indicated by automotive manufacturers, it was reported fourth overall by all respondents. This suggests a more strategic approach to globalization on the part of automotive manufacturers who are leveraging a global workforce not only to reduce the costs of product development but to gain more insight into unfamiliar markets. This sensitivity to regional difference is particularly important for the automotive industry, which is not only highly regulated, but diversely so. Moving from one market to another can entail negotiating an entirely new set of product requirements. Additionally, automotive preferences and driving conventions can shift dramatically from one market to another. For automotive manufacturers, being able to compete globally is a matter of being able to understand local markets.

The Challenges of Global Design

While turning to a global design strategy can provide the opportunity to lower the cost and speed up the processes involved in product development, it is a strategy that comes with a number of its own challenges that can create obstacles unique to a dispersed product development team (Table 2). By and large, automotive manufacturers don't report any challenges that differ significantly from respondents across all sectors.

Table 2: Top Challenges on Global Design

Challenges	Auto	All Respondents
Protecting Intellectual Property (IP)	57%	61%
Retaining company knowledge of products or product design decisions	50%	44%
Keeping distributed designs synchronized	37%	40%

Source: Aberdeen Group, October 2007

Regardless of industry, protecting product Intellectual Property (IP) is a major challenge of global product development. As designs are outsourced, particularly to partners in regions with differing legal protections and standards, valuable product design data becomes less secure. This is the case for automotive companies as well, although these companies are slightly less concerned about it than other companies. This is because automotive suppliers are already accustomed to sending their IP to OEMs. In order to win business from an OEM and maintain a relationship with them, automotive suppliers must do what the OEM requests. Often, this can mean returning native CAD to an OEM as they develop a design, which relinquishes IP.

Additionally, retaining company knowledge of products or product design decisions is a big challenge for automotive companies, indicated more often than all respondents (50% compared to 44%). Rapid innovation is a top pressure and the ability to leverage product knowledge is important in continuing to build upon innovation and release new innovations. Additionally, making existing product knowledge available for reuse is a bigger challenge for automotive companies than their peers. This may be due to the difficulty of sharing information across automotive programs. Each program prefers to do things their own way, making it difficult to reuse data from program to program.

The Three Pillars of Effective Global Design

Aberdeen's October 2007 *Profitable Design Chains: Global Product Design Comes of Age* report found there are three key areas where the Best-in-Class have developed the capabilities that allow them to overcome their challenges and most effectively leverage their global design initiatives: protect product IP, design in parallel, and coordinate the global design team.

Protect Intellectual Property

While protecting IP was the top challenge for automotive manufacturers, they are not doing a lot to address it. As they look to access new talent in other global regions, this will remain a top challenge. However, despite this, these companies are behind the Industry Average in terms of implementing capabilities that would help to protect IP (Table 3).

Table 3: The Competitive Framework - Protecting IP

	Best-in-Class	Industry Average	Auto
Sharing varied levels of design accuracy with different partners (based on need for detail)	63%	41%	38%
Product knowledge and IP retained by company	82%	69%	52%
Digital Rights Management (DRM) / design security	41%	19%	21%

Source: Aberdeen Group, October 2007

“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.

Automotive companies are a bit behind the Industry Average in terms of simply retaining product IP. Again, some of this is due to common practices in the automotive industries. In the past, automotive companies have not needed to take extra precautions to protect their IP, but minimal IP protection is a greater liability in a global design environment. The varying degree of copyright protection in different countries means automotive companies need to take additional steps to protect their IP. A way to do so is to vary the level of design details that are shared with partners. Here again, automotive manufacturers are slightly behind the Industry Average.

Technologies around protecting data and keeping it secure have evolved significantly over the years and automotive companies are at a disadvantage by not taking advantage of it. One of the largest differentiators of Best-in-Class performance uncovered in Aberdeen's *Profitable Design Chains* report was the use of Digital Rights Management (DRM) or another design security capability to keep design data secure. This is true for the automotive sector as well. Best-in-Class manufacturers are 95% more likely than automotive companies on average to have this capability in place. These technologies can provide them with increased control over the individuals who have access to the data as well as control over how long access is available before it expires.

Design in Parallel

Automotive manufacturers report higher adoption of the capabilities and technologies that enable globally dispersed teams to work on designs in parallel. In all of these areas, they report adoption that is about on par or slightly ahead of the Industry Average (Table 4).

Table 4: The Competitive Framework - Design in Parallel

	Best-in-Class	Industry Average	Auto
Parallel development of different portions of design across design chain	65%	30%	33%
Formal review process after consolidating designs from across design chain	69%	47%	52%
Designers design with visibility to adjacent assemblies or subsystems (in context)	71%	51%	45%
Real-time, interactive design collaboration tools	59%	36%	41%
Design collaboration (visualization, review, markup)	76%	55%	52%

"We need to maintain standards for our designs. If we inspect to the same model as we use in creation, the final part will conform to the design intent. When the two items are separated, we open up the opportunity for errors."

~ Engineering Manager,
Automotive Supplier

Source: Aberdeen Group, October 2007

Conducting formal design review involving outside parties is nothing new for the automotive industry. OEMs have been relying on suppliers for decades. In fact, many of the collaboration tools available on the market today were developed with automotive companies in mind. However, because

collaboration between suppliers and OEMs is so critical to the way automotive designs are developed, automotive companies should strive to close the gap between themselves and the Best-in-Class and continue to invest in collaboration tools.

Automotive companies have specific challenges around the ability to visualize entire vehicles. Given the amount of data, this is a memory intensive task and it may not even be possible to view the entire vehicle in a CAD system. In addition, everyone involved may not have access to the CAD system the components were developed within. Collaboration and visualization tools can address these challenges and allow stakeholders to discuss aspects of the design, exchange ideas, and problem-solve. However, while automotive manufacturers have adopted many of these tools and capabilities, they have not necessarily taken full advantage of them to leverage specialized engineering skills at a global level and design different aspects of their products in parallel. Best-in-Class companies are 2.2-times more likely than automotive companies to develop portions of the design in parallel.

Parallel product development provides an avenue to address the second top pressure for automotive companies - market demand for rapid innovation. Parallel product development involves supplementing existing resources with low cost engineering resources. With more resources, the design process can be accelerated, without a significant increase in budgets. Supporting parallel development requires the ability to design with visibility to adjacent assemblies or subsystems, helping to ensure that changes made to one aspect of a design can be accommodated by teams working on another aspect. The Best-in-Class are 58% more likely than automotive manufacturers to take steps to do so. By enabling global collaboration in this way, automotive companies will also be better positioned to capture the knowledge and the reasons why design decisions were made, which helps them adapt to the need to work with a global workforce to access specialized skills.

Coordinate the Global Design Team

Global design requires a greater degree of attention to the management of design tasks in a way that allows dispersed teams to effectively work on a single design. This need becomes more acute the closer companies come to realizing parallel development. It's no surprise then, that keeping distributed designs synchronized shows as a top pressure both among automotive manufacturers (37%) and across industries (40%). Implementing the capabilities to coordinate the global design team will help to address this issue. The Best-in-Class approach this challenge in a programmatic fashion, adopting standardized processes and design tools such as formal program and project management to coordinate activities across the design chain (Table 5).

Table 5: The Competitive Framework - Coordination

	Best-in-Class	Industry Average	Auto
Standard design processes across global design chain (for both internal and external resources)	71%	37%	23%
Formal project and program management across design chain	63%	55%	40%
Central management and control over internal and external designers in design chain	63%	58%	45%
Product Lifecycle Management (PLM)	53%	33%	41%
Product Data Management (PDM)	82%	51%	52%

Source: Aberdeen Group, October 2007

Standardized processes help companies to coordinate activities as well as ensure that different portions of the design can be incorporated with minimal effort. The Best-in-Class are 40% more likely to have central management over both internal and external designers in the design chain, which also supports keeping designs in synch. Additionally, both the Best-in-Class and the Industry Average are more likely than automotive manufacturers to use formal program and project management across the design chain.

The Best-in-Class are also more likely to utilize data management solutions, which help to enforce synchronized design. This includes not simply Product Data Management (PDM) but also Product Lifecycle Management (PLM) solutions. PLM includes PDM capabilities, but also supports extended business processes and / or collaboration capabilities. Automotive companies are more likely than the Industry Average to adopt PLM, but are still 29% less likely than the Best-in-Class to do so. PLM helps to support the business processes and collaboration that enable parallel development. PLM in particular, provides mechanisms to capture knowledge and the means to keep design data centralized and synchronized. Extended capabilities such as workflow help to keep processes on track. Given the length of the development process, the number of components, and the complexity of the design, adopting these capabilities and deploying the tools that support them could be a great benefit to automotive companies.

Required Actions

Automotive manufacturers can learn from the Best-in-Class to improve how they leverage global design chains in ways that can help reduce the costs of development while addressing key challenges of global design. This includes taking steps to:

- **Invest in the means to protect IP.** In today's evolving market, keeping product IP secure will remain a significant challenge. Without the capabilities in place to keep IP safe, automotive

companies are inhibiting their ability to take advantage of some of the strategic benefits of global product development that the Best-in-Class enjoy.

- **Enable design teams to work in parallel.** Automotive manufacturers should continue to look to implement processes and technologies to support parallel development. This will help to accelerate the design process and put them in a better position to keep costs down as well as boost revenue.
- **Coordinate the global design team.** Keeping the global design team coordinated helps to keep the design in synch. Getting to parallel design can pose significant challenges to the management of not simply design tasks, but all of the aspects of the design itself.

For more information on this or other research topics, please visit www.aberdeen.com.

Related Research

[*Profitable Design Chains: Global Product Design Comes of Age*](#) October 2007
[*The Global Product Design Benchmark Report*](#) December 2005

[*System Design: New Product Development for Mechatronics*](#) January 2008
[*Configuration Management for Aerospace and Defense*](#) December 2007

Author: Michelle Boucher, Analyst Product Innovation & Engineering Research (michelle.boucher@aberdeen.com)

Since 1988, Aberdeen's research has been helping corporations worldwide become Best-in-Class. Having benchmarked the performance of more than 644,000 companies, Aberdeen is uniquely positioned to provide organizations with the facts that matter — the facts that enable companies to get ahead and drive results. That's why our research is relied on by more than 2.2 million readers in over 40 countries, 90% of the Fortune 1,000, and 93% of the Technology 500.

As a Harte-Hanks Company, Aberdeen plays a key role of putting content in context for the global direct and targeted marketing company. Aberdeen's analytical and independent view of the "customer optimization" process of Harte-Hanks (Information – Opportunity – Insight – Engagement – Interaction) extends the client value and accentuates the strategic role Harte-Hanks brings to the market. For additional information, visit Aberdeen <http://www.aberdeen.com> or call (617) 723-7890, or to learn more about Harte-Hanks, call (800) 456-9748 or go to <http://www.harte-hanks.com>

This document is the result of primary research performed by Aberdeen Group. Aberdeen Group's methodologies provide for objective fact-based research and represent the best analysis available at the time of publication. Unless otherwise noted, the entire contents of this publication are copyrighted by Aberdeen Group, Inc. and may not be reproduced, distributed, archived, or transmitted in any form or by any means without prior written consent by Aberdeen Group, Inc.