

## Faster to Market without Sacrificing Quality and Lifecycle Profitability in Industrial Equipment Manufacturing

Aberdeen Group's December 2007 *Product Innovation Agenda 2010: Profiting from Innovation Today and Tomorrow* study found that industrial equipment manufacturers are focused on improving product profitability by accelerating time to market through the continuous streamlining of product innovation, product development, and engineering processes. This attention to shortening time to market windows is consistent across all manufacturing industries, where there is a growing recognition that corporate growth lies in bringing innovative products to market ahead of the competition. Industrial manufacturers not only must deliver products on shorter schedules but without compromising quality standards. Failure to meet this challenge could lead to losses in sales, but also lost profit margins and excess cost in service and warranty. This Sector Insight identifies how Best-in-Class manufacturers speed time to market without sacrificing product quality, and what industrial equipment manufacturers can do to improve product profitability.

### Goals for Product Development

Improving product profitability is on the top of the executive agenda for industrial manufacturers. Industrial manufacturers report "a lot of emphasis" on increasing product revenue and decreasing product cost at about the same frequency as their peers across all manufacturing sectors (Table I). In addition, cost pressures can be particularly acute for these companies, as a result of increased global competition. Again, industrial equipment companies report cost pressure at about the same level as peers in other manufacturing industries.

**Table I: Goals for Product Development**

"A lot of emphasis" on:	All Respondents	Industrial Equipment
Increase product revenue	82%	83%
Decrease product cost	60%	58%
Decrease product lifecycle cost	29%	36%
Increase value of intellectual property	36%	34%
Decrease product development cost	36%	30%
Decrease corporate risk	36%	27%

Source: Aberdeen Group, May 2008

Of particular interest, however, is the heightened attention that industrial equipment companies place on product lifecycle costs. Roughly one-third of

### Sector Insight

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

### Sector Definition

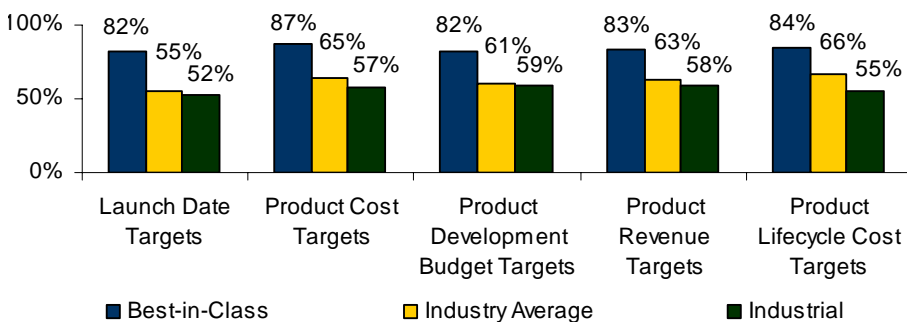
For the purposes of this study, respondents who indicated that they operated within the industrial manufacturing space (including industrial equipment; consumer durable goods; construction, architecture, and engineering industries) were isolated and aggregated for comparison against peer manufacturers across industries in Aberdeen Group's performance framework.

Industrial manufacturers report that they are placing "a lot of emphasis" on decreasing product lifecycle cost, about 25% more frequently than across all other manufacturing industries. This focus may, in part, be due to the recognition of higher profit margins from services creating an opportunity for service to be a profit center as opposed to a cost of doing business. Industrial manufacturers are well aware that profitability is not just about the initial sale, and therefore can't sacrifice quality for the sake of speed. Unplanned warranty and service costs can erode profitability over a product's lifecycle. Additionally, new business models that reward the manufacturer for the uptime of their equipment - or even more to the point those that pay the manufacturer based on the productive service their equipment provides - place a larger burden on industrial equipment manufacturers to ensure product quality and reliability.

### Aberdeen Analysis

Balancing product performance with streamlined development processes is not accomplished easily. Industrial manufacturers reported cost pressures and short product launch windows, at 58% and 40% respectively, as their top two product development challenges. Despite these challenges, the [Product Innovation Agenda 2010](#) report found that the industrial manufacturers are performing about on par with Industry Average performers across key product development metrics that drive profitability (Figure 1).

**Figure 1: Performance Framework**



Source: Aberdeen Group, May 2008

The two areas where industrial manufacturers are most challenged - meeting launch dates and product lifecycle costs. These are also the areas where they have the most opportunity for improvement. Best-in-Class companies are 58% more likely than industrial equipment manufacturers to successfully hit launch date targets, and 53% more likely to hit lifecycle cost targets, and Industry Average performers are 20% more likely to hit these targets. To bring products to market more quickly while still increasing profitability, industrial equipment manufacturers must balance time to market with product quality, which can have considerable implications on cost across the product lifecycle. Higher quality products are more likely to meet product lifecycle cost targets, but at the risk of delaying product

#### 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

launches. How do Best-in-Class companies approach product development in a way that balances this risk?

**Opportunities for Industrial Equipment Manufacturers**

To improve their performance in these areas, industrial equipment 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 innovation, development, design, and engineering, including capabilities that many industrial equipment companies already plan to adopt in the coming years as part of their strategic initiatives (see Table 2, Table 3, and Table 4).

**Product Innovation**

The Best-in-Class view product innovation as a business process that can be measured and managed, a perspective that industrial equipment manufacturers have begun adopt. These companies are adopting open innovation as a process and are measuring innovation performance using performance metrics, and subsequently are ahead of the Industry Average in both of these capabilities (Table 2).

**Table 2: The Competitive Framework - Product Innovation**

	Best-in-Class 2008	Industry Average 2008	Industrial Equipment		
			2008	2010	Growth
Measure innovation performance with formal metrics	36%	22%	26%	67%	158%
Process owner for the innovation process	68%	49%	43%	74%	72%
Open innovation processes	72%	31%	32%	53%	66%
Ability to retrieve and leverage related innovations (parents, etc.)	70%	53%	45%	74%	64%
Chief Product / Innovation Officer or equivalent executive is responsible for product innovation	54%	35%	37%	50%	35%

Source: Aberdeen Group, May 2008

However, industrial equipment manufacturers fall behind the Industry Average in other capabilities that support effective innovation. In particular, these companies have the opportunity to adapt their organizations in ways that support innovation. The Best-in-Class are 58% more likely than industrial equipment manufacturers to appoint dedicated process owners for innovation, and 46% more likely to assign executive-level ownership responsible solely for innovation.

These capabilities allow Best-in-Class performers to "operationalize" innovation as a predictable, repeatable process. Further, by 2010 almost three-quarters of industrial equipment companies have plans to appoint a process owner for the innovation process. Along with the capability to measure innovation performance, these two process changes are the biggest expected growth areas for industrial equipment companies over the next two years.

**Product Development**

Industrial equipment manufacturers report a strong focus on streamlining and promoting efficiency in product development. In fact, these companies exceed the Industry Average in the adoption of most of the capabilities reported by the Best-in-Class (Table 3).

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

	Best-in-Class 2008	Industry Average 2008	Industrial Equipment		
			2008	2010	Growth
Formal knowledge capture and reuse strategies	52%	27%	27%	70%	159%
Product development metrics used to drive continuous improvement	48%	29%	28%	68%	143%
Implement Lean product development concepts	48%	18%	30%	65%	117%
Measure performance of product development with formal metrics	48%	35%	38%	77%	103%
Formal feedback process from suppliers / contract manufacturers	48%	25%	34%	66%	94%
Centralized or coordinated product development decisions across the enterprise	76%	45%	48%	79%	65%
Different product development processes by type of project	50%	33%	39%	64%	64%

Source: Aberdeen Group, May 2008

The top capability growth area for industrial equipment manufacturers is improvement of knowledge capture and reuse. Although the Best-in-Class are almost twice as likely as industrial manufacturers to have formal knowledge capture and reuse strategies, 70% of industrial equipment companies report they will have this capability in place by 2010. Design reuse is important for any company hoping to improve efficiency, reduce cost, and capture the undocumented "tribal knowledge" that exists within the engineering and manufacturing organizations. Formalized knowledge capture processes may also drive up quality, and help reduce product lifecycle costs such as warranty and service costs. In this way, companies can target faster time to market, but without sacrificing long-term profitability.

Lean product development concepts are another high growth area, with adoption planned to more than double by 2010. Since Lean initiatives focus on removing non-value added tasks from the development process, engineers can concentrate on design tasks and product innovation. This should result in higher quality products and faster time-to-market. Aberdeen Group's May 2007 [Lean Product Development Benchmark Report](#) found that Best-in-Class companies are 1.4-times as likely as Industry Average companies to have pursued Lean product development strategies for more than one year, and as a result, are able to bring products to market 25% faster.

"We have improved product innovation by applying Lean concepts to engineering and implementing value engineering concepts."

~ CEO, Industrial Equipment Manufacturer

**Product Design and Engineering**

Product design and engineering is the area where industrial equipment manufacturers are planning to make the most significant changes. These companies are looking to integrate product and manufacturing process design and improve visibility between engineering and downstream departments (Table 4).

**Table 4: The Competitive Framework - Product Design and Engineering**

	Best-in-Class 2008	Industry Average 2008	Industrial Equipment		
			2008	2010	Growth
Formal feedback process from supplier / manufacturer	58%	39%	31%	66%	113%
Digital simulation and prototyping of manufacturing processes	40%	28%	25%	50%	100%
Metrics used to drive continuous improvement in engineering	56%	32%	35%	70%	100%
Integrated product design with manufacturing process design	60%	54%	46%	84%	83%
Visibility to supply / obsolescence implications of decisions	54%	28%	37%	66%	78%
Visibility to regulatory impact of decisions	68%	44%	43%	76%	77%
Formal collaborative processes	56%	37%	52%	84%	62%
Visibility to manufacturing feedback / experience in design process	72%	46%	51%	81%	59%
Centralized product data	63%	49%	60%	91%	52%
Visibility to requirements and constraints during design process	72%	53%	56%	82%	46%
Digital simulation and prototyping of products	80%	54%	57%	77%	35%

Source: Aberdeen Group, May 2008

The [Product Innovation Agenda 2010](#) report found that during the design process, Best-in-Class companies are more likely to give engineers greater downstream visibility into the impacts of their decisions. For example, they are 57% more likely than the Industry Average to design with visibility to manufacturing feedback.

In addition, supporting capabilities such as digital simulation and formal collaborative processes enable "smart assembly." This "virtual factory" concept is a Best-in-Class practice that enables manufacturers to transition smoothly and quickly from design to full scale full volume production. The Best-in-Class are 43% more likely than the Industry Average to have digital simulation and prototyping of manufacturing processes.

Fifty percent (50%) of industrial manufacturers project they will have digital simulation and prototyping of manufacturing processes by 2010, indicating a 100% growth rate. In addition, 84% of industrial equipment manufacturers project that they will have put formal collaborative processes in place in the next two years, which will place them on par with the Best-in-Class.

Aberdeen's November 2007 [Digital Manufacturing Planning: Concurrent Development of Product and Process](#) report indicates that the Best-in-Class companies are able to shrink the time to market by using simulation to speed manufacturing process planning and developing manufacturing

processes and production equipment in parallel with the product design. These improvements in visibility, formal feedback, and collaborative capabilities will help engineers make better design choices, and thus help cut down the number of issues that arise later in the product lifecycle. Industrial equipment manufacturers that successfully implement these capabilities will ultimately create significant savings in cost and time.

### Technology Investment Areas

To help bring product and manufacturing processes more closely together, both digital manufacturing process planning and digital manufacturing process simulation appear high in the list of planned technology investments in the industrial manufacturing sector (Table 5). Not only are industrial equipment manufacturers projecting greater focus on digital manufacturing capabilities, they also intend to support these plans with investments in related technologies. Digital manufacturing process planning stands out, for example, with 144% growth planned in the industrial sector, compared to only 29% growth among the Best-in-Class and 88% growth across all respondents.

**Table 5: Top 10 Innovation Technology Growth Areas for Industrial Equipment Manufacturers 2008-2010**

	Currently Use	Plan to Adopt by 2010	Growth 2008-2010
Digital Rights Management (DRM)	11%	30%	173%
Digital manufacturing / manufacturing process planning	16%	39%	144%
Product Lifecycle Management (PLM)	28%	68%	143%
Digital manufacturing / manufacturing process simulation	16%	38%	138%
Obsolescence management	23%	46%	100%
Real-time design collaboration	36%	69%	92%
Business Intelligence (BI) / analytics	35%	64%	83%
Product Data Management (PDM)	44%	80%	82%
Manufacturing Execution Systems (MES)	29%	52%	79%
Advanced search capabilities	36%	63%	75%

Source: Aberdeen Group, May 2008

The technology area expected to see the most growth among industrial equipment manufacturers is Digital Rights Management (DRM), as it is for other industries as well. Protecting Intellectual Property (IP) is a big concern for industrial equipment companies and their peers, as found consistently in Aberdeen research. The October 2007 *Profitable Design Chains: Global Product Design Comes of Age* Benchmark Report, for example, found that top-performing companies are more than twice as likely as the Industry Average (and nearly four-times as likely as Laggards) to use DRM. This technology helps to ensure that only the intended recipients can access design data, and limits what they are allowed to do with it. These technologies provide a layer of security that helps protect proprietary information "in the wild" outside of the centralized system, including technology to limit transfer and

even expire rights to file usage. The [Product Innovation Agenda 2010](#) report shows that while only 11% of industrial equipment manufacturers currently have DRM, almost a third will have it in the next two years, a rapidly emerging trend.

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. For the purposes of this report, PLM is defined as Product Data Management (PDM) integrated with business processes. Only 28% of industrial equipment manufacturers report that they have currently adopted PLM, compared to 31% of the Industry Average companies. However, industrial equipment companies are planning significant investment in PLM solutions, with 143% growth expected over the next two years.

With PDM adoption expected to grow by 82%, it looks as though industrial equipment manufacturers may be skipping right over independent PDM and moving straight to PLM. This is just as well, as respondents report an expected broad adoption of PLM by 2010, with a majority of both the Best-in-Class and Industry Average using it, that it may soon cease to be a performance differentiator. PLM capabilities, and related PLM enablers such as collaboration and advanced search, will become common best practices for companies striving to improve performance.

## Required Actions

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Industrial equipment manufacturers report priorities to improve product profitability and corresponding actions to improve the efficiency of product development processes. However, while they've taken a number of strides in the right direction, they lack many of the capabilities that distinguish the Best-in-Class. Industrial equipment manufacturers looking to improve their performance should:

- **Improve downstream visibility to manufacturing and supply chain impacts.** Although digital manufacturing process planning and digital manufacturing process simulations are among the top technology growth areas for industrial companies, only 16% currently have either of these solutions. Taking advantage of these digital manufacturing concepts, as well as implementing formal feedback and collaborative processes, will allow industrial equipment manufacturers to enhance product quality by identifying and reducing errors before design decisions are locked down.
- **Continue organizational shifts toward innovation leadership.** Industrial equipment companies are starting to view product innovation as a process, and are implementing capabilities such as open innovation and innovation reuse. However, they also need to appoint resources responsible for innovation. By 2010, 80% of Best-in-Class companies are expected to have a dedicated process owner responsible for product innovation processes, and 71% will have a C-level executive assigned to this role. Despite

projected growth of 72% in adopting a process owner for innovation, industrial equipment companies will be left at approximately Industry Average performance unless they accelerate adoption of these key capabilities.

- Implement Lean product development.** Best-in-Class companies are 60% more likely than industrial equipment manufacturers to have Lean product development concepts in place, and are almost twice as likely to have formal knowledge capture and reuse strategies in place. These capabilities are both expected to double in the next two years among industrial equipment manufacturers. By implementing these processes along with supporting capabilities such as centralized product data, centralized product development decisions, and advanced search, industrial equipment companies have the potential to significantly shorten product development schedules.
- Establish PLM.** PLM will become much more commonplace by 2010, meaning it will become less of a competitive differentiator. Those still without it, however, will be at a considerable disadvantage. PLM supports centralized data, collaboration, and automation of business processes, all of which will help accelerate and improve the development process.

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

Related Research	
<a href="#"><i>Product Innovation Agenda 2010: Profiting from Innovation Today and Tomorrow</i></a> ; December 2007 <a href="#"><i>Lean Product Development</i></a> ; May 2007 <a href="#"><i>Digital Manufacturing Planning: Concurrent Development of Product and Process</i></a> ; November 2007	<a href="#"><i>Profitable Design Chains: Global Product Design Comes of Age</i></a> ; October 2007 <a href="#"><i>Protecting Product IP: Safeguarding Design Intellectual Property in a Global Market</i></a> ; November 2006 <a href="#"><i>Global Design Strategies for Industrial Equipment Manufacturers</i></a> ; March 2008
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