

Promoting Product Development Efficiency for High Technology Companies

Data from Aberdeen Group's December 2007 *Product Innovation Agenda 2010* study found that high tech manufacturers are focused on improving product profitability with a dual focus on increasing revenue and reducing product cost. This is consistent with what Aberdeen found across manufacturers in all other industries, although high tech companies show a particular emphasis on protecting and improving the value of their product Intellectual Property (IP). To achieve these goals, high tech companies are focusing on bringing innovative products to market ahead of the competition. This is not a new strategy, but it is a particularly acute problem for an industry where market windows are short and the value of innovation is often short-lived before competitors follow suit with a copycat product or another new product.

Goals for Product Development

Improving product profitability is on the top of the executive agenda for high technology manufacturers (Table I). Like other companies, they are simultaneously focused on increasing product revenue and lowering product cost. They are less focused on lowering product development costs, but are about on par with their peers in other sectors in this regard. These companies are more focused, however, on increasing the value of their IP than other industries. This attention to IP is related to the push for innovation in a sector that quickly sees market share lost to copycat products. Getting the most value out of design intellectual property is often critical to creating sustainable revenue growth.

They are also more focused on lower product lifecycle costs compared to other industries. This is an area where these companies are struggling (Figure 1), but the extra attention they report on decreasing these costs suggests that they are taking steps to address this issue.

Table I: Goals for Product Development

"A lot of emphasis" on:	All Respondents	High Tech
Increase product revenue	82%	81%
Decrease product cost	60%	61%
Increase value of intellectual property	36%	48%
Decrease product development cost	36%	36%
Decrease product lifecycle cost	29%	34%

Source: Aberdeen Group, December 2007

Sector Insight

Aberdeen's Sector Insights provide strategic perspective 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 high tech industry were isolated and aggregated for comparison against peer manufacturers across industries in Aberdeen Group's performance framework. High tech included those in consumer electronics, computer equipment and peripherals, software, and telecommunication equipment.

Challenges of Developing New Products

As with their goals for product development, the top challenges high tech companies report are on par with their peers in other industries: cost pressure from customers. This is a ubiquitous and enduring challenge of developing and releasing innovative products.

The second largest challenge reported by these companies, faster product commoditization / shorter lifecycles, however is more specific to their industry. They reported this issue almost twice as often, indicated by 44% of high tech companies compared to 24% of respondents across all sectors. Not only do products face a short lifecycle, but the window to introduce new products is shorter (39%). This is why speed is so critical. These companies need to excel in meeting launch dates, and they often don't have long to capture value before competitors release similar products. This challenge is likely driving the amount of attention high tech is paying to increasing the value of their IP.

This is also related to the challenge of protecting IP, which is reported twice as often by high tech manufacturers than other industries. Keeping IP secure is one of the few options these companies have to deflect fast followers. Other industries have a number of elements that can't be reverse engineered quickly and even if they are, it can take quite a while just to get the tooling ready. This is not the case for electronics, which generally has shorter ramp up times. As manufacturing and more engineering work is performed overseas, protecting design IP becomes a greater challenge and taking advantage of the benefits of these strategies can potentially mean exposing IP to competitors.

Table 2: The Top Six Challenges for Product Development

	All Respondents	High Tech
Price (cost) pressure from customers or sales channels	53%	48%
Faster product commoditization / shorter lifecycles	24%	44%
Short windows for new product introduction	41%	39%
Increased competition	32%	27%
Globalization of markets and / or supply chains	25%	23%
Protecting IP	10%	20%

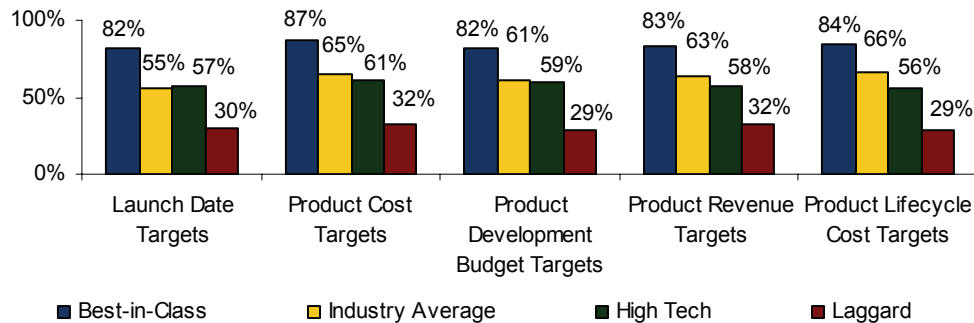
Source: Aberdeen Group, December 2007

Aberdeen Analysis

Balancing product performance with streamlined development processes is not accomplished easily. Aberdeen Group's December 2007 [Product](#)

[Innovation Agenda 2010](#) report benchmarked high tech companies' ability to meet their product development targets related to time, cost, and revenue. Aberdeen's research indicates that the performance of high tech manufacturers is slightly behind the Industry Average across key product development metrics that drive profitability (Figure 1).

Figure 1: Maturity Class Framework



Source: Aberdeen Group, December 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

The one exception is product launch. High tech companies are hitting their targets for product launch dates slightly more often than the Industry Average. This should not be surprising given the increased importance of speed for product development in this industry. They also approach the Industry Average in their ability to hit product development costs.

Where these companies fall further behind is in their ability to meet product lifecycle cost targets. It is possible that these companies are hitting launch dates at the expense of product quality, which drives up warranty and service costs. It has already been noted above that high tech manufacturers are more likely than their peers to report decreasing lifecycle costs as a corporate goal, which suggests that they have recognized their lagging performance in this area.

Opportunities for High Technology Manufacturers

To improve their ability to bring products to market rapidly, high tech manufacturers can look to the steps the Best-in-Class have taken to improve the effectiveness and 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 advantage they currently hold. Encouragingly, the data shows that many of these are also capabilities that high tech companies plan to adopt in the coming years as part of their strategic initiatives.

Product Innovation

According to Aberdeen's [Product Innovation Agenda 2010](#) report, the Best-in-Class are taking steps to transform innovation into a formal, repeatable process. High tech companies are following suit and placing greater

emphasis on innovation. In fact, they report adoption of many of the capabilities that differentiate Best-in-Class performance in this area ahead of the Industry Average (Table 3).

Table 3: The Competitive Framework - Product Innovation

	Best-in-Class 2008	Industry Average 2008	High Tech		
			2008	2010	Growth
Measure innovation performance with formal metrics	36%	22%	28%	71%	154%
Open innovation processes	72%	31%	31%	62%	100%
Ability to retrieve and leverage related innovations (patents, etc.)	70%	53%	41%	73%	78%
Process owner for the innovation process	68%	49%	42%	67%	60%
Chief Product / Innovation Officer or equivalent executive responsible for product innovation	54%	35%	41%	59%	44%

Source: Aberdeen Group, December 2007

The top product innovation growth area reported by these companies is the measurement of innovation performance with formal metrics. This should help them to improve product development success rates, reduce costs, and more predictably deliver innovation as performance gains visibility. Currently, 28% of high tech companies measure innovation performance, which is slightly ahead of Industry Average companies. In 2010, the majority (71%) of these companies will be tracking their innovation performance with formalized metrics. While this is a great deal of growth, the industry will be a bit behind the Industry Average and Best-in-Class, an anticipated 77% and 84% of which will have this capacity in 2010.

The next highest growth area is the adoption of an open innovation process, which is currently a highly differentiating capability of the Best-in-Class. 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. Effectively, this means that an enterprise is able to select the best innovation that fits its needs and to hedge its bets that internal research and development will discover the next greatest product or technology. High tech companies expect to double their adoption of this practice, but again are expecting less growth than the Industry Average.

Finally, high tech companies expect a lot of growth in their ability to retrieve and leverage related innovations. This is another Best-in-Class differentiator. The ability to leverage existing innovations allows companies to develop products faster than developing new innovations. This ability is particularly valuable for high tech companies that must remain tightly focused on speed. Additionally, if they are able to execute on improving the value of their intellectual property this can be an extremely important capability.

Product Development

Currently high tech companies are roughly ahead of the Industry Average in adoption of the capabilities that support a Best-in-Class approach to product development (Table 4). This is expected to continue into 2010, with the Industry Average remaining slightly behind high tech in most areas.

Table 4: The Competitive Framework - Product Development

	Best-in-Class 2008	Industry Average 2008	High Tech		
			2008	2010	Growth
Implement Lean product development concepts	48%	18%	23%	64%	178%
Measure performance of products with formal metrics	48%	35%	35%	84%	140%
Formal knowledge capture and reuse strategies	52%	27%	29%	69%	138%
Formal feedback process from suppliers / contract managers	48%	25%	38%	80%	111%
Product development metrics used to drive continuous improvement	48%	29%	35%	73%	109%
Centralized or coordinated product development decisions across the enterprise	76%	45%	42%	72%	71%
Different product development processes by type of project	50%	33%	46%	68%	48%

Source: Aberdeen Group, December 2007

High tech companies are expecting the greatest amount of growth in the implementation of Lean product development initiatives. Lean is a concept that has had a lot of impact on supply chain management and manufacturing operations. The general premise is around reducing 'waste' or non-value-added tasks and promoting the efficiency of development processes. Currently it is a significant performance differentiator, with the Best-in-Class being 2.6-times as likely as the Industry Average and 2.1-times as likely as high tech manufacturers to have adopted Lean in product development stages.

High tech companies are also expecting a lot of growth in the ability measure product development performance. Measuring performance will help them identify bottlenecks to better streamline processes and improve overall product development efficiency, which will ultimately result in a faster time to market. They also anticipate a great deal of growth in their adoption of product development metrics used to drive continuous improvement, which is expected to grow 109% from 35% to 73% of high tech companies.

The third highest growth area is in enhancing the ability to capture and reuse knowledge. Only 29% of high tech manufacturers today are leveraging reuse strategies, which is only a little over half the Best-in-Class. However, growth is expected to be 138% with 69% of high tech manufacturers able to

capture and reuse product development knowledge. This is related to the capability to leverage related innovations in earlier stages of development, and will speed development processes by leveraging existing IP rather than "reinventing the wheel." This is also related to the anticipated adoption of a formal process for feedback from suppliers and contract manufacturers. Given the amount of outsourcing in high tech, it can be harder to capture knowledge for later reuse. A formal process for feedback will help in this regard and likely help them lower product costs. This is one area where the growth expected in high tech will result in higher adoption than the Best-in-Class, 76% of whom project that they will possess a formal process for feedback from suppliers and contract manufacturers by 2010.

"Our ultimate goal is to pull necessary functional groups together early in the development process. As of today, engineering is designing the product with little interaction from other stakeholders. This should improve communication as well as the schedules to complete the projects."

~ Configuration Systems
Manager,
Electronic Security
Manufacturer

Product Design and Engineering

High tech manufacturers report a less consistent focus on R&D best practices than they do in product development or innovation. They tend to fall behind both the Best-in-Class and Industry Average overall. There are some areas where they exceed the Industry Average, such as the use of metrics to drive engineering improvement and the centralization of product data (Table 5).

Table 5: The Competitive Framework - Engineering

	Best-in-Class 2008	Industry Average 2008	High Tech		
			2008	2010	Growth
Digital simulation and prototyping of manufacturing processes	40%	28%	19%	56%	195%
Visibility to supply / obsolescence implications of decisions	54%	28%	37%	80%	116%
Formal feedback process from supplier / manufacturers	58%	39%	38%	81%	113%
Integrated product design with manufacturing process design	60%	54%	38%	81%	113%
Formal collaboration processes	56%	37%	42%	84%	100%
Visibility to requirements and constraints during design process	72%	53%	44%	86%	95%
Metrics used to drive continuous improvement in Engineering	56%	32%	38%	73%	92%
Visibility to regulatory impact of decisions	68%	44%	39%	71%	82%
Visibility to manufacturing feedback / experience in design processes	72%	46%	49%	81%	65%
Centralized product data	63%	49%	55%	91%	65%
Digital simulation and prototyping of products	80%	54%	52%	82%	58%

Source: Aberdeen Group, December 2007

The areas where high tech have a lot of opportunity for improvement include, among others: the use of formal collaboration processes, formal feedback processes from suppliers and manufacturers, and integrated product and manufacturing process design.

However, these are also the areas where they are expecting the most growth. High tech companies will be able to match the Industry Average in these areas over the next two years. Fifty-six percent (56%) of both the Industry Average and high tech companies anticipate they will digitally simulate manufacturing processes by 2010. Digital simulation of manufacturing processes can help identify problems earlier, which means avoiding delays in manufacturing that affecting time to market. A further Best-in-Class differentiator is the integration of product design and manufacturing process design process. High tech companies are currently behind the Industry Average, but they are expecting 113% growth. This will also help with improving the efficiency of the release of designs to manufacturing.

Combined with the high anticipated growth these companies report in developing a formal feedback process from suppliers and manufacturers and increased visibility to manufacturing consequences of design decisions, these capabilities suggest that while high tech companies may be outsourcing more, they want to do more than just outsource a BOM. They want to be more involved with manufacturing process decisions.

High tech companies are also planning to enhance visibility to supply / obsolescence implications of design decisions. This is currently a strong Best-in-Class differentiator. These companies are 46% more likely than high tech companies and 93% more likely than the Industry Average to currently have this capacity. Interestingly, this is one of the few areas in product design and engineering where high tech companies report higher adoption of a capability than the Industry Average. However, visibility to supply and obsolescence are important capabilities for an industry such as high tech where product lifecycles are extremely short.

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 central location for data and provides a foundation to implement and automate Best-in-Class product development processes.

It is not surprising, then, that adoption of PLM among high tech manufacturers is expected to grow 92%, from 39% currently to 75% over the next two years. However, if adoption trends continue, they will only be slightly ahead the Industry Average, 69% of which will have adopted PLM by 2010. In fact, PLM shows such broad adoption by 2010, with only a slightly higher adoption rate in the Best-in-Class using it (79%), that it may cease to

“We are increasing the amount of simulations we run on our products to improve performance. The hope is that this will cut out a number of engineering change cycles and allow us to meet the competition's ability to spit out product quickly.”

~ Engineering Manager
Consumer Electronics
Manufacturer

be a performance differentiator and become simply a prerequisite for competitive performance.

Expanding from core PLM, then, will be critical in continuing to improve and support speed and efficiency of product development. Table 6 lists the top ten technology growth areas for high tech manufacturers. The top area among high tech is digital rights management (DRM) software, which helps to protect product design data. Considering the importance of protecting and increasing the value of intellectual property that these companies report, this is an important step.

Digital manufacturing process simulation solutions are the solutions with the second highest growth plans, with high tech expecting to more than double their current adoption. This is consistent with the projected manufacturing simulation capability growth they reported and will help them find problems that could delay time to market much sooner. Related to this, Digital manufacturing / manufacturing process planning is also a top growth area for high tech, slightly ahead of PLM.

High tech is also anticipating a lot of growth in obsolescence management and obsolescence data solutions. Considering the shorter product lifecycles and their slipping ability to contain lifecycle costs, this should be an area of focus for high tech companies.

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

	Currently Use	Plan to Adopt by 2010	Growth 2008 - 2010
Digital Rights Management (DRM)	19%	45%	137%
Digital manufacturing / manufacturing process simulation	20%	48%	140%
Obsolescence data	32%	70%	119%
Digital manufacturing / manufacturing process planning	29%	56%	93%
Product Lifecycle Management (PLM) defined as PDM with integrated business processes	39%	75%	92%
Obsolescence management	32%	60%	88%
Real-time design collaboration	42%	79%	88%
Advanced search capabilities	47%	80%	70%
Manufacturing Execution Systems (MES)	31%	54%	74%
Business Intelligence (BI) / analytics	42%	74%	76%

Source: Aberdeen Group, December 2007

Required Actions

High tech manufacturers report priorities around both increasing product revenue and decreasing product costs. Overall, they are roughly on par with the Industry Average in both performance and the adoption of the Best-in-Class capabilities that support that performance through the stages of the

product development. As they continue to improve their programs, these companies should look to the following steps to help promote efficiency and shorten product development cycles:

- **Invest in PLM.** PLM will become commonplace in 2010, meaning it will become less of a competitive differentiator. Seventy-five percent (75%) of high tech manufacturers plan to adopt PLM in the next two years. Those without it will be at a competitive disadvantage. Additionally, PLM supports many of their planned improvements for 2010 and will centralize data, support collaboration with suppliers and manufacturing, and reuse and help automate business processes, all of which will help accelerate the development process.
- **Stay abreast with new processes such as Lean and open innovation.** High tech companies should turn their attention to new processes such as open innovation and Lean product development. Best-in-Class performers are looking more often outside of their enterprise for innovative product ideas or technologies, being 2.3-times as likely as high tech manufacturers to pursue open innovation. They are also twice as likely to implement Lean product development strategies. Adopting these concepts can open up new opportunities for growth, speed time to market, reduce risk, and reduce inefficiencies and cost from product development processes.
- **Leverage existing information assets for knowledge capture and reuse.** It can be difficult to further improve the speed of processes in an industry where design cycles are already tightly compressed. Capturing and reusing existing information assets is one way that these companies can improve efficiency while simultaneously lowering development costs. The Best-in-Class are currently 79% more likely than high tech manufacturers to do so. Taking this step helps companies to avoid repeating work that has already been completed as well as make information easier to access.
- **Get the most value out of product IP.** High tech companies report a consistent focus on securing and improving the value of product intellectual property. Currently, only 19% of these companies have the DRM tools in place protect IP. This is the highest area for growth over the next two years, and those companies that adopt it will help prolong market windows and improve the overall profitability of their products.

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

Related Research

[Product Innovation Agenda 2010;](#)
December 2007
[The Lean Product Development](#)
[Benchmark Report;](#) May 2007

[The Protecting Product IP Benchmark](#)
[Report;](#) November 2006

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