AberdeenGroup

New Product Development: Profiting from Innovation

Business Value Research Series

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Executive Summary

Developing a new technology or solution that fills a need for a customer is fulfilling. This feeling of accomplishment is not accompanied by the pleasant jingle of coins in the corporate pockets, however, unless the idea makes its way out of the innovator's head, off of the planning board, and eventually off of the engineer's hard-drive. Product development teams and executives alike need to measure the success of innovation the way the corporation measures success – by the bottom line.

Turning a concept into a profitable product or product platform is not an easy job, and requires people from multiple disciplines to work together. New product development (NPD) is a complex, collaborative process that requires coordinating the innovation efforts of many to meet a common goal. The following is a list of participating groups that may be required for a product to successfully come to market:

- Marketing
- Engineering
- Procurement
- Regulatory
- Manufacturing
- Design
- Suppliers
- Sales / Channels
- Finance
- Legal
- Manufacturing Engineering

Different organizations and individuals are responsible for one or more aspects of the product, and few of these aspects can stand alone. Decisions made in one facet of a product impact many others. Aberdeen's *Product Innovation Agenda* benchmark reported the importance of new product development processes to increasing product revenue and decreasing product cost. The report determined that companies that are best-in-class at new product development and introduction tend to have the following similarities:

- A senior manager is directly responsible for overseeing the full process of identifying innovation opportunities, engineering them, developing them into products, and bringing them to market.
- Innovation strategy is centrally controlled or coordinated.
- Measurement of innovation performance is frequent, and at an enterprise level.
- Product development is enabled by PLM-related technologies.

This report expands upon one major conclusion of the benchmark report, that "innovation is a team sport." Companies need to enhance product development processes in order to bring profitable products to market in a predictable, repeatable way. The organizations listed above, along with program management and information technology (IT) should also play important roles in new product development by enabling the coordination, communication, collaboration, and control required to succeed in a challenging innovation market. The report concludes that for companies to remain competitive in the face of a more challenging innovation environment and challenging corporate profitability objectives, they must significantly improve product development performance.

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Chapter One:
Issue at Hand

Aberdeen's *Product Innovation Agenda* benchmark report evaluated the product innovation, product development, and engineering performance of manufacturers to determine the actions they are taking, business capabilities they are pursuing, and technical enablers they are using to contribute to their corporate product strategy. The study reported two findings that combine to form a major challenge for manufacturers today:

- The product innovation environment has become more difficult, and
- Corporate product strategies are demanding not only growth, but also product cost reduction – or "profitable growth."

This increasingly challenging environment means that business as usual will not allow companies to achieve past levels of success. The shift to a more aggressive, growth strategy means that past levels of performance are no longer enough. Both of these findings lead to a need for companies to step up performance in their product innovation processes. The combination of the two indicates that companies accepting status quo for their product development performance will likely lag significantly behind their competition.

What has made product innovation more difficult? The following challenges were identified by survey respondents as part of their top three product innovation challenges:

- Cost pressure has intensified (51% report as top three challenge);
- Product lifecycles have shrunk (49% in top three);
- Competition is tougher (48% in top three);
- Markets and supply chains are globalizing (36% in top three);
- Product complexity has increased (30% in top three); and
- Products reach commodity status more quickly (27% in top three).

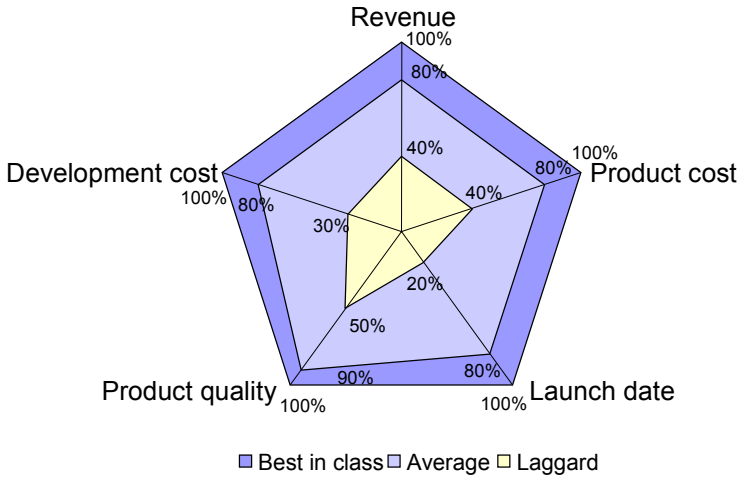
Coupling these challenges with trends toward greater outsourcing and global manufacturing highlights the increasingly challenging innovation environment that companies must overcome to develop new products. Aberdeen's *Global Product Design* benchmark report indicates that today's products are frequently brought to market by cross-enterprise teams that span geographic boundaries. Product innovation executed by global design networks adds additional challenges in the areas of communication, collaboration, and control to an already complex problem.

Even without these additional challenges, companies are not hitting their product development targets (Figure 1). Results from the benchmark study indicate that the majority of companies are not able to consistently hit their product development targets in any of five key measures, including percent of products meeting revenue targets, cost targets, launch date targets, quality targets, or product development cost targets.

Aberdeen's *Product Innovation Agenda* benchmarked manufacturers in their ability to meet product development targets for revenue, product cost, product development cost, launch dates, and product quality. Top performers in these metrics, those Aberdeen calls the "best in class," hit all of their product development targets between 80% and 100% of the time, as represented by the dark band around the outside of Figure 1. The best in class also met product quality targets between 90% and 100% of the time. The lighter band highlights companies that fall into the industry norm, which meet their product development targets less frequency, for example between 20% and 80% for meeting product launch dates. The inner ring represents companies that are the bottom performers, and shows their inability to meet development targets. Missed product development targets result in missed market opportunities.

Clearly there is room for improvement in the great majority of companies. The benchmark data shows very different levels of performance between laggards and best-in-class performers. Aberdeen identified common characteristics of the top performers to help identify what has allowed them to be successful. These characteristics are discussed in Chapter 3, Implications and Analysis, to help companies determine how to improve their product development performance and gain competitive advantage.

Figure 1: Ability to Meet Product Development Targets



Source: Aberdeen*Group*, September 2005

With an alarming number of companies missing their development targets, corporate strategies demanding more product innovation, and inhibitors to product development success on the rise — the time is right for significant focus on improving product innovation and product development capabilities.

Chapter Two:
Key Business Value Findings

A key takeaway from the *Product Innovation Agenda* benchmark report is that "product innovation is a team sport." Conceptualizing, designing, developing, engineering, and introducing a new product requires the convergence of a number of disciplines and skills ranging from strategic marketing to technical analysis. The complexity of today's products, which often include combined technologies such as electrical and mechanical design (or formulation and advanced packaging), demands expertise that can rarely be addressed by a single individual. In addition, many products now require coordination between companies that supply different aspects of a total solution, such as the relationship between a device manufacturer and the software companies providing third-party applications. In order to gain access to diverse skill sets, companies have participated in greater outsourcing of product design and manufacturing, leading to even greater complexity of product development projects.

Consider an electronic gaming system like the Sony PSP or a music player such as the Apple iPod. These product offerings require an intricate combination of powerful branding, targeted marketing, stylish design, electrical components, mechanical structure, operating software, connected applications from third-party developers, and global launch initiatives. Considering the rapid development cycles and the need for multiple suppliers' contributions to work in harmony — from both a product perspective and a supply chain perspective — it is amazing that these products can be launched with any level of quality and market success. Other products have different complexities in product development, but a core theme identified in these projects is the need for people to contribute to different aspects of the project simultaneously, while keeping the product and the project working as a whole.

Although the "lifecycle" aspect of product lifecycle management (PLM) stands out and attracts attention, product innovation is as much about broadening the view on product development across departments and the value chain as it is about managing the different stages of a product's life. Turning a concept into a profitable product or product platform is not an easy task, and requires coordinating the innovation efforts of many to meet a common goal. The following is a partial list of the teamwork required for a product to successfully come to market:

- *Marketing* must understand what will motivate customers to buy the product, quantify the market opportunity, and commercialize the product.
- *Engineering/Design* must understand and meet the requirements efficiently, within constraints for cost, quality, and regulatory compliance.
- *Procurement* must help ensure that the product incorporates components that work from cost, regulatory, supply risk, and supplier performance perspectives.
- *Regulatory* must ensure that the product will be in compliance, and be portable across regulatory bodies and geographies.

- *Manufacturing Engineering* must ensure manufacturability, optimize the use of assets, design lines and tooling, and ensure optimal cost and quality.
- *Manufacturing* must ensure that the product can reach volume production within capacity, capabilities, target cost, and quality guidelines.
- *Suppliers* must validate that they can deliver on expectations.
- *Sales and channels* should provide input on customer requirements, help to determine portfolio priorities, and help in attaining early customers for the product during launch.
- *Finance* has to validate that financial projections are accurate and that the product will return a healthy margin.
- *Legal* must ensure that intellectual property rights are protected.

These team members may offer direct input into the new product development project. In addition to these, additional support comes from roles that help the overall project execution environment run more smoothly, including program management offices (PMO) and Information Technology (IT). Program Management should be added to the team roles list above to control project execution across disciplines. IT should also play an important role in new product development by enabling the coordination, communication, collaboration, and control required to succeed in a challenging innovation market.

Improved Innovation Drives Results

Benefits are available from improving product innovation, product development, and engineering performance. As corporate strategies target profitable growth, new business processes and enabling PLM technology have helped to improve both sides of the profitability equation — revenue and cost. The following benefits were reported by participants in the *Product Innovation Agenda* benchmark report, with 84% of respondents citing benefits in more than one of the following benefit areas (Table 1):

Table 1: Benefits of Improved Product Innovation

Benefit	Average Improvement
Increase Product Revenue	**19%**
Decrease Product Cost	**15%**
Decrease Product Development Cost	**16%**

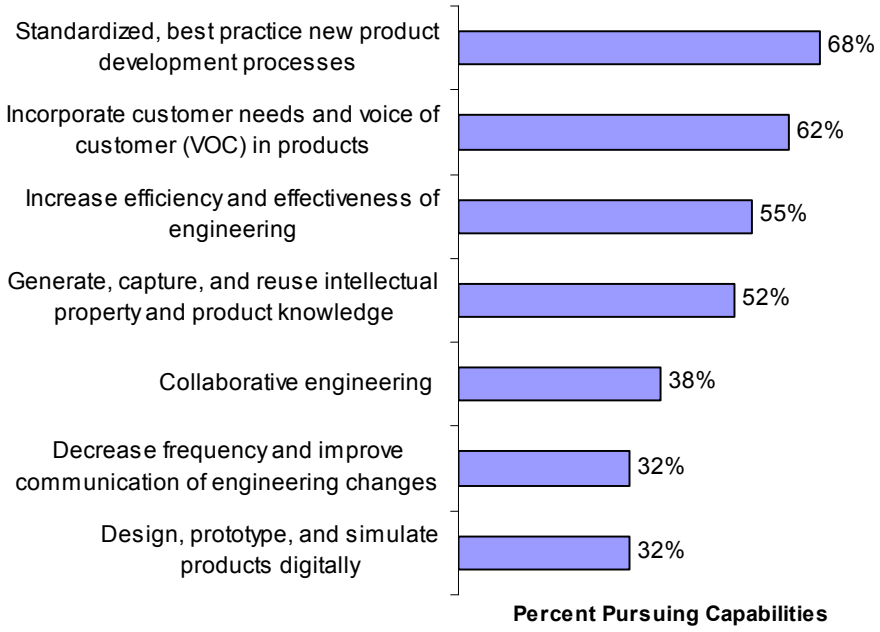
Source: Aberdeen*Group*, September 2005

Taking Action on the Opportunity

Manufacturers are reaping these gains by taking action to improve performance. They are also pursuing business capabilities that are primarily aimed at improving team performance in new product development, and coordinating those efforts around customer needs (Figure 2). To further understand the team effort required to introduce a new product ef-

fectively, this paper will further discuss the need to address four aspects of new product development: Coordination, Communication, Collaboration, and Control.

Figure 2: Product Innovation Capabilities to Increase Revenue



Source: AberdeenGroup, September 2005

- ***Coordinate*** the product development project around customer needs, and establish the right NPD team and approach.
- ***Communicate*** the requirements to all participants, keep them informed of all aspects of status and decision-making throughout the program, and ensure that product data is well managed and available throughout the life of the project (and beyond).
- ***Collaborate*** across disciplines to make informed choices that take into account the upstream and downstream impact of decisions on all levels of the project.
- ***Control*** the project to manage program and development team complexities, and put in place performance measurements and milestones to keep the project on track.

Coordinate

Almost three-quarters of benchmark participants rank "increasing the fit of products to customer and market needs" as the most important factor in increasing product revenue (72%).

No product development program can be successful without proper upfront planning. Selecting the appropriate products to target, identifying the proper requirements for the project, developing an NPD approach, and determining the right players in the process are critical.

Success also includes capturing the voice of the customer and other product requirements to align the team around what will make the product a success. Too frequently, early product requirements are not kept in the forefront during the project as decisions are made. Projects at all phases should be centered on customer requirements.

Choosing the right product to target in the first place can be a challenge. *The second most important action to increasing product revenue, according to survey respondents, is "increasing the value of new products chosen" (70%).* Aligning resources around the most valuable projects means understanding the potential market opportunity in relation to the overall new product development and introduction (NPDI) risk.

Communicate

Change management is important to multiple aspects of product profitability, with 50% of manufacturers acting on change management to reduce product development cost, 61% acting on change management for product cost reduction, and 32% pursuing change management to help increase revenue.

Once the targets are set and the team organized, ensuring that all participants are informed, updated, and working on the same information is critical. NPD projects span departments, companies, time zones, and sometimes continents. Keeping the lines of communication open is critical to launching and executing NPD project effectively and within target timelines. Again, the requirements, goals, and targets should remain the central part of the product development process.

Product information must also be controlled and communicated for effective NPD. Ensuring that participants are working on the same information at the project level as well as the design level is critical. This is a foundational element that enables NPD. This is true between engineers, but also between technical and commercial team members that typically don't interact informally on a regular basis and may require more structure to encourage information sharing. Better managing product data also offers other benefits. *Participants indicated that generating, capturing, and reusing intellectual property (IP) and product knowledge was very important to improving product revenue (52%).*

Collaborate

Manufacturers indicate that collaboration capabilities rank very highly in improving product revenue, with more than half of respondents indicating that project collaboration (66%) and design collaboration (50%) are very important technical enablers for product innovation.

Beyond communicating status to all impacted parties, collaboration means making decisions jointly. Whether the decision is at the design level or at the overall program level, NPD decisions should not be made in a vacuum. Product development projects can now leverage experts from multiple disciplines and take advantage of expertise wherever it can be found. In addition, products and projects have interdependencies that must be taken into account. Working jointly at all levels of the project increases product development effectiveness and helps companies avoid making suboptimal decisions that have unforeseen negative impacts on other aspects of the development effort.

Collaboration comes in many forms, including sharing documents, jointly working on designs, meeting collaboration, chatting electronically, participating in threaded discus-

sions, and others. Manufacturers are using collaboration capabilities in many ways to improve product development. *Collaboration impacts more than revenue. More than three-quarters of respondents say project management and collaboration are "very important" to reducing development cost, and about two-thirds indicate the importance of collaborating on product costs early in the product lifecycle (68%).*

Control

The most important action to increasing product revenue, according to survey participants, is to utilize standardized, best practice, new product development processes (68%).

New product development and introduction is a discipline unto itself. Many companies identified standardization of processes across projects as important to product development cost reduction, but more importantly to the higher strategic benefit of increasing revenue. Common new product development methodologies are available that incorporate best practices and can be leveraged as a starting point for most companies, including Stage-Gate processes and Product And Cycle-Time Excellence (PACE). Processes that are standardized can be measured and improved over time, with lessons learned from past experience applied to current initiatives. Chapter 3 will discuss the importance of metrics and performance measurement in more detail.

NPD projects must coordinate resources, tasks, and deliverables. Multi-stage, multi-departmental projects often have complex interdependencies, which are difficult to manage and track without the proper tools. NPD projects are complex and require formal management and control so as not to miss product development targets and market opportunities. *To better control projects, manufacturers surveyed indicate that project and program management are the highest priority technical enabler (66%) for product innovation.*

Chapter Three:
Implications and Analysis

Aberdeen's Competitive Framework defines three levels of enterprise performance as a way to determine business approaches that lead to success. Respondents to Aberdeen's *Product Innovation Agenda* benchmark report were asked to submit their performance in the following characteristics in order to classify them as "Laggards," "Industry Norm," or "Best in Class" with regard to meeting product development targets:

- Percent of products meeting revenue targets;
- Percent of products meeting product cost targets;
- Percent of products meeting launch date targets;
- Percent of products meeting product quality targets; and
- Percent of products meeting development cost targets.

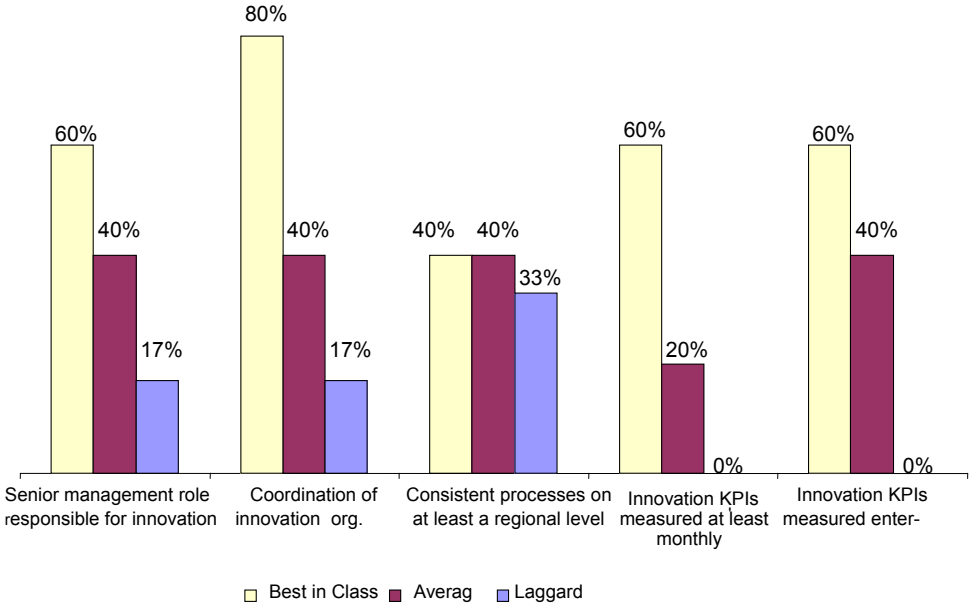
These metrics were chosen in order to indicate which companies were in better control of their new product development processes. Based on responses to these questions, respondents were classified by performance. The performance benchmarks were then compared with organizational structure and automation to determine the impact these characteristics have on innovation performance.

Organization

Less than one-quarter of companies surveyed have C-level execs in charge of the full innovation process, including identifying product ideas, engineering them, and bringing them to market. This contrasts with 60% of best-in-class companies that have a chief product officer, chief innovation officer, or the equivalent (Figure 3).

For effective new product development, companies must provide centralized control of programs, if not the entire enterprise. Given the complexity of new product development projects, it is unreasonable to expect departmental management and control to ensure success on a programmatic level. Some companies have invested in central program management offices (PMO) and certified product development managers to enable centralized coordination and control of initiatives.

Figure 3: Competitive Framework – Managing for Product Innovation Success



Source: Aberdeen*Group*, September 2005

Metrics

Best-in-class are three times more likely to measure key performance indicators across projects on at least a monthly basis than their peers. For specific product development projects, performance measurement is very important in order for companies to successfully meet targets. Unpublished analysis from the *Product Innovation Agenda* indicates that the top two metrics companies believe can help improve their product innovation success are project related:

- 59% of respondents indicated that improving time to market would have a positive impact on improving product innovation performance.
- 56% of manufacturers said that improving new product success rate would lead to improved innovation performance.

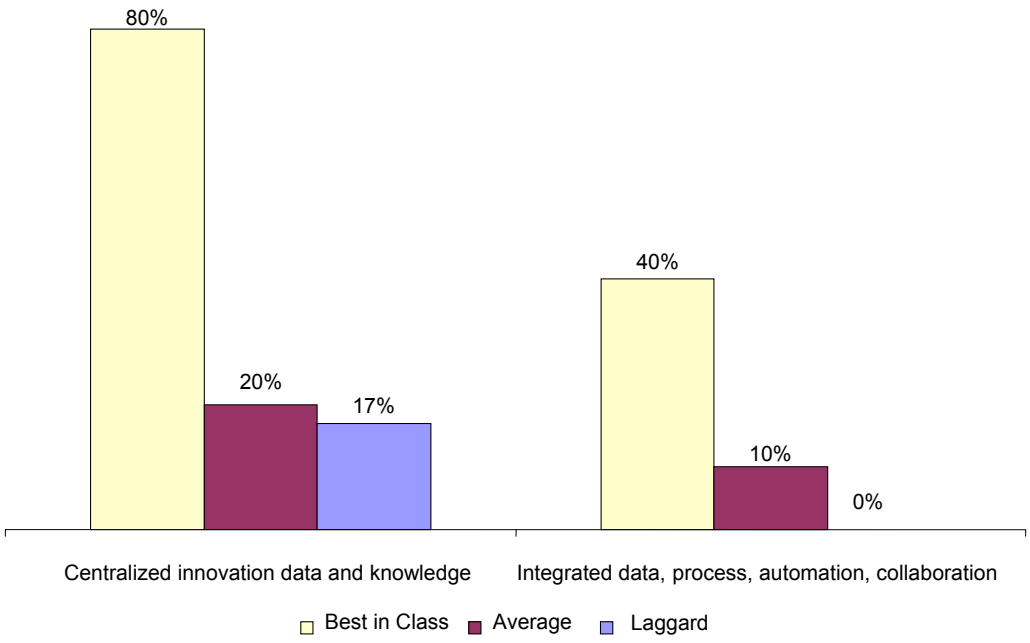
Given the direct tie between project-related success factors and overall product innovation performance, NPD improvements should be considered a high priority to increase product profitability.

Technology

Best-in-class companies are four times more likely to have PLM-related technology than their poorer performing competitors (Figure 4). Companies that are better able to meet product development targets, are also more likely to have centralized data and product knowledge than the industry norm. In addition, top performers are also four times more likely to have integrated data and process automation, with collaboration infrastructures

for projects and products. Automation clearly plays a significant role in helping companies achieve product innovation and product development success.

Figure 4: Enabling Product Innovation Success



Source: Aberdeen*Group*, September 2005

Chapter Four:
Recommendations for Action

To succeed in a challenging innovation environment, and to bypass status quo to achieve profitable growth, companies must set themselves up for success. Aberdeen benchmarks show that companies that effectively organize, use enabling technologies, and measure performance achieve better new product development results. To that end, companies should:

- **Organize for innovation success.** Best-in-class performers are more likely to have centralized control. Consider organizing new product development across departments underneath a key executive such as a chief product officer or chief innovation officer and operating projects under a central project manager or project management office (PMO).
- **Automate to improve NPD performance.** Best-in-class companies have centralized infrastructures to manage product data and collaboration processes. Look for technology to help coordinate, communicate, collaborate, and control product development.
- **Standardize and automate NPD processes.** Respondents clearly indicated that standardized processes are a leading approach to improving product development performance. Process automation can be used to help implement and enforce standard processes.
- **Measure performance on project and enterprise levels**. Companies that are best-in-class at meeting product development targets measure performance more frequently, and on a broader scale.

In addition to setting the appropriate infrastructure for success, companies should execute their new product development processes following proven, best practice processes. To succeed in bringing profitable products to market, companies should focus on excelling in the following aspects of new product development:

- Coordinate the product development project around customer needs, and establish the right NPD teams and approaches.
- Communicate customer requirements to all participants, and keep them informed of all aspects of status and decision-making throughout the program. Ensure that product data is well managed and available throughout the life of the project (and beyond).
- Collaborate across disciplines to promote informed choices that take into account the upstream and downstream impact of decisions on all levels of the project.
- Control projects to manage program and development team complexities, and put in place performance measurements and milestones to keep projects on track.

Author Profile

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Jim Brown leads AberdeenGroup's Global Product Innovation and Engineering research. Its goal is to provide fact-based research and experienced analysis that advises executives on how to achieve maximum product profitability and corporate value by using the right approaches and enabling technology to identify, specify, engineer, develop, and continuously improve innovative, high-value products.

Jim founded research and consulting firm Tech-Clarity, acquired by Aberdeen in May 2005. Tech-Clarity focused on making the value of PLM and enterprise software solutions clear to manufacturing business leaders. Jim began his professional experience with roles in manufacturing engineering and software systems at General Electric before joining Andersen Consulting (Accenture), where he focused on enterprise software applications. He has also served as an executive at several software companies and as the PLM analyst for Technology Evaluation Centers and The PLM Evaluation Center. Jim is a frequent author and speaker on applying software technology to achieve tangible business benefits.

Appendix A:
Research Methodology

Between July and August 2005, Aberdeen examined the product innovation, product development, and innovation processes, experiences, and intentions of more than 125 enterprises in various manufacturing industries.

Responding companies completed an online survey that included questions designed to determine the following:

- The link between the company's corporate strategy and its product innovation goals;
- The importance of specific operational improvements that could be employed to reach companies' strategic product objectives;
- The business capabilities companies are pursuing to achieve operational improvement and strategic, financial goals;
- Current and planned use of automation and technology enablers to foster innovation capabilities and activities; and
- The benefits, if any, that have been derived from improving product innovation, product development, and engineering processes.

Aberdeen supplemented this online survey effort with telephone interviews with select survey respondents, gathering additional information on specific actions, capabilities, and enablers.

In November of 2005, the benchmark data was further analyzed to determine how companies could improve new product development processes and reach product innovation and product profitability targets.

Appendix B:
Related Aberdeen Research & Tools

Related Aberdeen research that forms a companion or reference to this report include:

- *Global Product Design Benchmark* (December 2005)
- *Enabling Product Innovation: Roles of ERP and PLM* (November 2005)
- *The Product Innovation Agenda Benchmark* (September 2005)

Information on these and any other Aberdeen publications can be found at www.aberdeen.com.

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- PRIORITIZE operational improvement areas to drive immediate, tangible value to their business
- LEVERAGE information technology for tangible business value.

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