



Aberdeen *Group*

The PLM for Small to Medium-Size Manufacturers Benchmark Report

Enabling Profitable Growth for SMEs

March 2006



Executive Summary

AberdeenGroup research shows that, like larger manufacturers, small to medium-size enterprises (SMEs) are focusing their product strategy on revenue growth in combination with cost reduction – to achieve profitable growth. However, as they pursue these goals, key targets such as product launch date, product development cost, product cost, and product quality are being missed.

What is causing this gap between goals and performance? First, SMEs face the same increasingly complex product innovation environment as large manufacturers – including faster product commoditization, globalization, outsourcing, and demand for more complex products – and are more keenly affected by time-to-market pressures. Yet their product development processes are frequently out of control or at least inadequate to simultaneously address these challenges. This AberdeenGroup research examines these issues, how SMEs are responding by implementing PLM software, and the challenges these smaller companies face when implementing new solutions. The study further analyzes what top performers are doing to overcome their implementation challenges in order to recommend practical actions that SMEs can take to improve their product-related processes and compete successfully in the complex global environment.

Key Business Value Findings

AberdeenGroup benchmark research shows that many SMEs are responding to the product innovation challenge by proactively focusing on product-related processes by planning for PLM (product lifecycle management) solutions. Those that have done so are achieving significant performance improvements, including increased revenues (19%), reduced product cost (17%), and decreased product development cost (16%).

Those SMEs that are engaged in PLM planning are looking to improve in the following critical areas:

- Control over product data and related project, product development, and program execution – to handle the increased complexity of product data and the growing size and diversity of distributed product development teams
- Design and project collaboration – to include processes and expertise from multiple parties earlier in the design process to optimize designs for manufacturing and sourcing, reduce product cost, and support parallel work to decrease time-to-market

However, SMEs face some unique challenges with PLM arising from their size, including the cost of implementation, the need to change business processes, and a lack of internal resources. Fortunately, software vendors are beginning to address these needs by offering solutions that facilitate PLM adoption. These include predefined workflows, data configuration templates, and industry-specific functionality, which reduce implementation barriers and provide a starting point for creating and automating processes that help to improve product development performance.



Implications & Analysis

Leading SMEs are, in fact, adopting PLM solutions that lower implementation barriers with tools including templates, industry-specific solutions, and best practice processes and then adjusting them as necessary. However, many times SMEs find these implementations aids unavailable when they need them, indicating a gap that SMEs must deal with during implementation.

Furthermore, to reduce the effort required for technical deployment, many leading companies also choose hosted and software-as-a-service solutions rather than buying the software and implementing it in-house on their own technical infrastructure.

Finally, best-in-class SMEs make changes involving people, organizational structures, performance measurement, and business processes – in addition to adopting PLM systems. These companies are more likely to create organizations geared to integrate the product development process, coordinate product management across departments, and put in place key performance indicators to monitor the success of their product development processes.

Recommendations for Action

Based on research findings, *AberdeenGroup* recommends that SMEs seeking to improve product innovation, product development, and engineering processes – in order to compete and win in the global environment – should take the following actions:

- Educate themselves on PLM including the implications of PLM outside of departmental and company boundaries, for example, with supply chain partners.
- Pick the right starting point by starting with a tangible business problem that they can solve and implementing a solution targeted to solve that problem as a foundation on which to build their full PLM solution.
- Look for PLM solutions that provide templates to common business processes and best practices and modify them if necessary, so they don't need to rethink every business process in an attempt to improve it.
- Seek solutions that fit their industry, through specialized solutions or industry templates. Software that provides a better fit will be more readily adopted by users.
- Include organizational, process, and performance measurement considerations in their PLM strategy.
- Consider hosted or software-as-a-service solutions to reduce the technical barriers to PLM adoption.
- Take advantage of the PLM opportunity to achieve tangible improvements. SMEs that do not adopt PLM will be at a competitive disadvantage.



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Chapter One: Issue at Hand

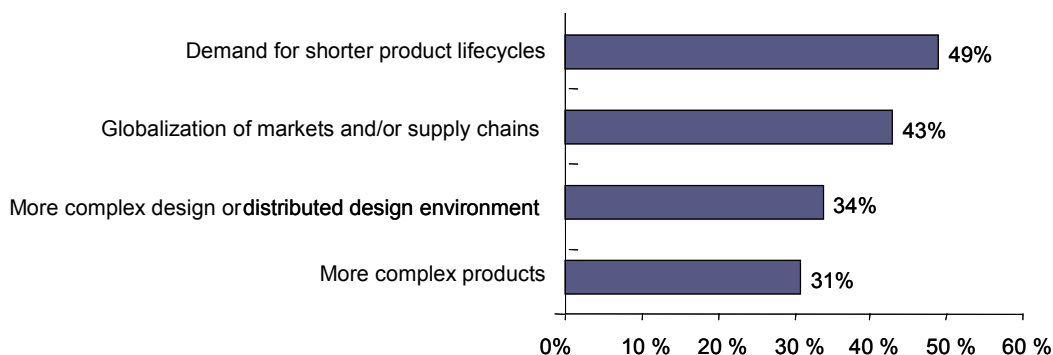
Key Takeaways

- SMEs face the same product innovation complexity challenges as larger manufacturers – including faster product commoditization, globalization and outsourcing, cost pressure, and corporate pressure for growth. However, they are more keenly affected by time-to-market pressures.
- Although SMEs are focusing on *profitable* growth – i.e., revenue growth in combination with a strong strategic emphasis on cost reduction – they are missing product launch, product development cost, product cost, and quality targets, indicating processes that are out of control.

SMEs Face Product Innovation Complexity

Manufacturers of all sizes are facing increased complexity in their product innovation environments, including faster product commoditization, outsourcing, globalization, cost pressure, and corporate pressure for growth. Aberdeen Group’s [Product Innovation Agenda](#) study indicates that small to medium-sized companies have many of the same challenges as their larger counterparts. Benchmarks of small to medium-size enterprises (SMEs) indicate that about one third outsource production and 22% outsource at least some of their product design, with about 75% having a global product design strategy in place. In addition, about half of respondents polled for this study report that they are facing demand for shorter product lifecycles, confirming previous research that indicates SMEs are even more keenly focused on time-to-market issues than larger enterprises (Figure 1).

Figure 1: Top Three Drivers for SMEs to Adopt PLM Solutions



Source: Aberdeen Group, March 2006



SMEs Seek Profitable Growth, Miss Development Targets

Despite the added complexity, these companies are not satisfied with simply addressing complexity and maintaining the status quo; they are simultaneously focusing on growth. According to AberdeenGroup’s *Product Innovation Agenda*, companies of all sizes are focusing their product strategies on revenue growth in combination with cost control – to achieve *profitable* growth. SMEs exemplify this focus, but place even higher strategic importance on cost reduction than their larger counterparts.

For many SMEs, achieving profitable growth in a more complex innovation environment is a significant challenge. AberdeenGroup research shows that companies of all sizes are not meeting product development targets. SMEs were benchmarked for this study on their ability to hit the following product development targets:

- Product revenue
- Product launch dates
- Product cost
- Product development cost
- Product quality

Competitive Framework Key

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

Laggards (25%) —practices that are significantly behind the average of the industry

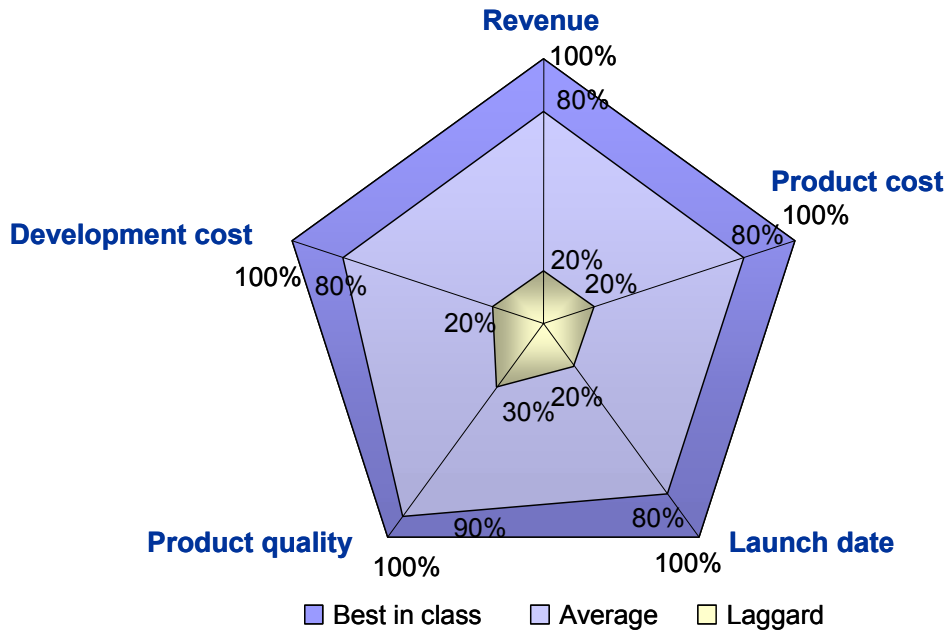
Industry norm (50%) —practices that represent the average or norm

Best in class (25%) —practices that are the best currently being employed and significantly superior to the industry norm

These benchmarks were compared with previous measurements of larger companies. The results indicate that the best-in-class SMEs (i.e., the top 25%) are performing at about the same level as the best-in-class larger companies. (See the Competitive Framework Key for definitions of *best in class*, *industry norm* or average, and *laggard*.) Average-performing SMEs, however, are doing more poorly than their larger counterparts and the worst performers – laggards – fall behind even further.

As an example, benchmarks for SMEs indicate that top performers hit their product launch date targets between 81% and 100% of the time (Figure 2), and average performers between 21% and 80% of the time. This middle tier, roughly 50% of SME companies, are clearly demonstrating product development processes that are out of control, making profitable growth very challenging. And laggards, the bottom quartile of performers, are hitting their product launch targets only 20% of the time or less. They show similarly poor results in meeting targets for product revenue, product cost, product development cost, and product quality.

Figure 2: SME Ability to Hit Product Development Targets



Source: AberdeenGroup, March 2006

More complex innovation environments...simultaneous demand to increase revenue and decrease product cost...product innovation, product development, and engineering practices that frequently result in missed targets – this set of challenge is difficult for any company to address, let alone small to medium-sized manufacturers that lack the deep pockets and broad organizational resources of their larger competitors. There is clearly an opportunity for improvement.



Chapter Two: Key Business Value Findings

Key Takeaways

- SMEs that seize the opportunity to improve their product innovation, product development, and engineering processes receive tangible benefits on a par with larger manufacturers, including increased revenues (19%), reduced product cost (17%), and decreased product development cost (16%).
- To address the increased complexity of product development environments and meet strategic goals for profitable growth, many SMEs are planning PLM implementations to better control product data; better manage the execution of project, product, and program development; and support design and project collaboration.
- SMEs face unique PLM challenges including the cost of implementation, the effort required to change business processes, and a lack of internal resources. However, best-in-class companies are using aids such as predefined, best-practice workflows, data configuration templates, and industry-specific software to implement PLM solutions, enabling them to meet product development targets.

An Opportunity for Significant Improvement

Despite the gloomy picture painted for SMEs, there is hope. Leaders are addressing the challenges mentioned in Chapter One proactively by focusing on improving product-related processes to facilitate product innovation, product development, and engineering processes. Although smaller companies appear to be less complex and seem to have less room for improvement because of their size, in fact, these companies are achieving significant performance improvements, resulting in tangible, corporate-level benefits on par with larger companies (Table 1).

Table 1: Benefits of Improved Product-related Processes - SME

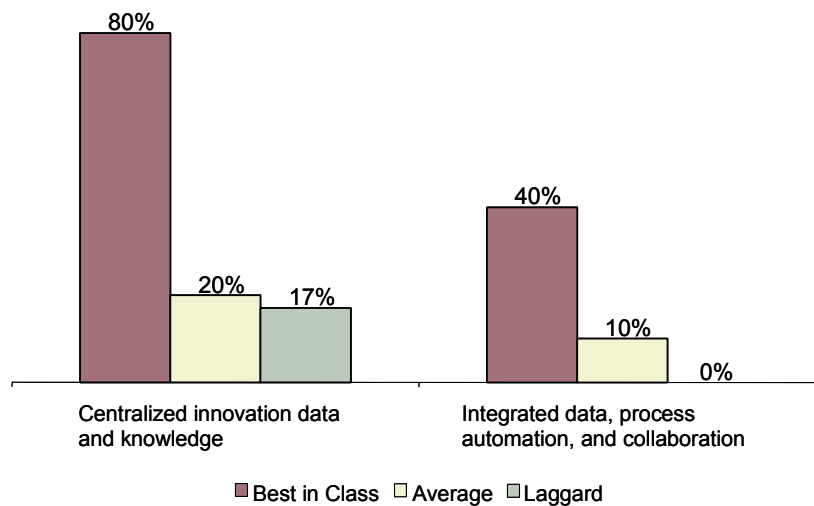
	All Companies	SME
Increased Revenue	19%	19%
Reduced Product Cost	15%	17%
Decreased Product Development Cost	16%	16%

Source: AberdeenGroup, March 2006



AberdeenGroup's *Product Innovation Agenda* analyzes best-in-class performers to identify common characteristics of top-performing companies. The research concludes that better performing companies are organizing and automating their businesses for innovation, leading to corporate success. In particular, the report disclosed that best-in-class manufacturers are more likely to have product innovation, product development, and engineering led by a central executive; measure performance more regularly; and are four times more likely to utilize PLM-related technology (Figure 3).

Figure 3: SME Ability to Hit Product Development Targets



Source: AberdeenGroup, March 2006

Unfortunately, SMEs have not organized or automated on a par with their larger counterparts. AberdeenGroup benchmarks show:

- Only 13% of SME currently have centralized product data.
- Over half have limited process automation and collaboration.

Despite the fact that improvements are available, they have not taken full advantage of the opportunity.

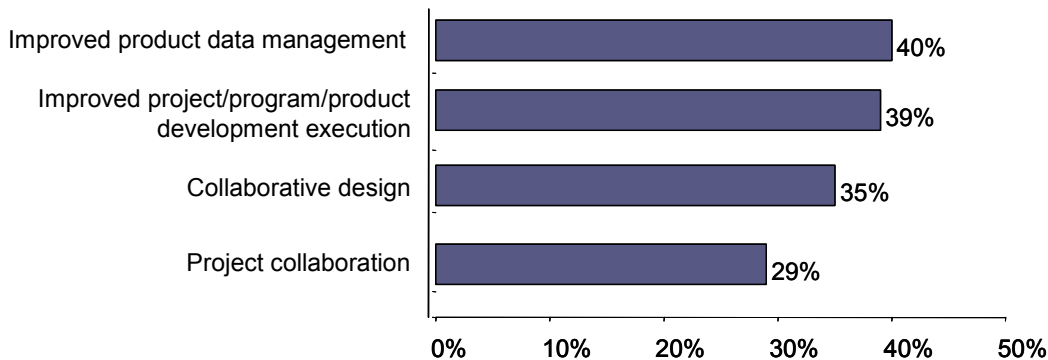
SME Are Taking Action, Planning for PLM

The benefits of PLM are available to SMEs, but these companies have been slower in making progress on the PLM adoption curve. SMEs tend to be more conservative, often waiting for new solutions to be well proven before adopting them. While many of the core capabilities of PLM applications have proven track records, today's expanded PLM solutions that enable collaboration, control, and communication of product innovation data and processes mark a recent shift from defining PLM as a group of traditional design-related tools.



However, SMEs are now planning to act: 17% of small to medium-size manufacturers indicate that they will be pursuing PLM solutions in the next 12 months. The top areas of investment are control-oriented solutions, including those that improve control over product data and related product development projects (Figure 4).

Figure 4: Top Three Strategic Actions for SMEs to Improve Product Development



Source: AberdeenGroup, March 2006

- *Improved product data management.* The increased complexity of product data, as well as the growing size and diversity of product development teams, creates a need for tight data controls. As a result, revision control, security management, search capabilities, and maintaining “one version of the truth” in regards to product information now comprise an essential foundation for a PLM infrastructure.
- *Improved project, product, and program development execution.* Faster project times, cross-functional teams, and dispersed resources require better control and communication in order to prevent mistakes and rework. Management of tasks, timelines, deliverables, approvals, and status extend core product data management with business process automation and project management capabilities to coordinate activities in addition to data.

In addition to seeking better controls for data and processes, SMEs are also looking to involve more parties in their design and development activities through collaboration. Shorter product lifecycles and rapid response to market demands are critical to SMEs’ success and require parallel design, development, sourcing, and marketing activities.

Collaboration infrastructure and tools allow companies to incorporate input from multiple parties early in the product development process to enhance designs and prevent rework.

- *Collaborative design.* The increased focus on optimizing product lifecycle impacts earlier in the design process – for example, design for manufacture and design for sourcing activities – are creating a demand for broader participation in design processes. In addition, many companies are including suppliers and other third parties in the design process to leverage external expertise. Sharing designs and gathering feedback, whether online reviews, embedded in documents, through remote access to



files, or with visualization technologies, provide the opportunity to build designs right the first time – enhancing time to market, product appeal, and product quality.

- *Project collaboration.* Today’s multi-disciplined project teams frequently cross department and even corporate boundaries. Project velocity requires that all resources work on the same information, with tight synchronization. Project collaboration tools provide shared access to deliverables, documents, project data, and tasks as well as promote and coordinate product development efforts.

SMEs Report Multiple Opportunities for PLM

Many PLM solutions provide broad and varied capabilities and, therefore, offer many opportunities to improve. In addition to the actions being pursued in Table 4 (above), SMEs are targeting improvements in all aspects of their product innovation, product development, and engineering performance. The following improvement initiatives are also being pursued by survey respondents:

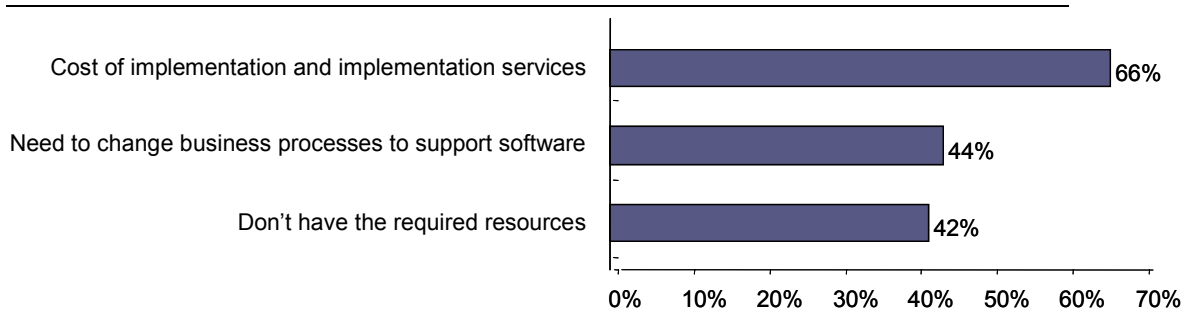
- Design for Lean
- Increased reuse of designs and parts
- Concurrent engineering
- Digital manufacturing/manufacturing process management/simulation
- Product simulation/virtual prototyping/virtual assembly
- Design for Six Sigma
- Design for mass customization/“to order” manufacturing
- Design for sourcing/total cost management
- Design for serviceability
- Enhanced portfolio management
- Design for environmental and regulatory compliance

SMEs Face Unique Challenges with PLM

In response to increasing complexity and strategic directives for profitable growth, many SMEs are planning to improve product innovation, product development, and engineering processes with PLM technologies. SMEs face challenges when considering or implementing PLM, however, that are unique to smaller-sized organizations (Figure 5). In particular, they frequently do not have the same resources available and are often daunted by the effort to make the business changes required when adopting PLM technologies. In other words, operational improvement does not come without change and requires investments beyond the cost of the software. *In fact, less than one third of participants in this SME benchmark mentioned the cost of a software package as a challenge to adopting PLM solutions. Their concern, instead, was focused on successfully incorporating the solution into the business.*



Figure 5: PLM Adoption Challenges for SMEs



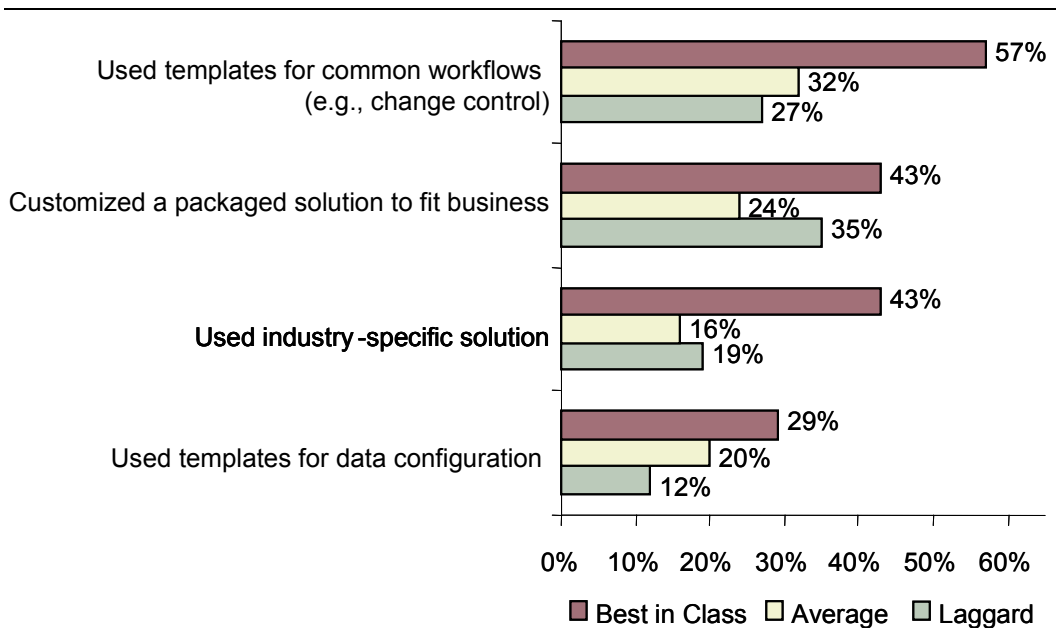
Source: AberdeenGroup, March 2006

- *Cost of implementation.* Implementations of enterprise software solutions require acceptance and adoption – i.e., regular use – by the business in order to provide value. To achieve successful adoption, companies must assess their business processes, identify the changes to be targeted and the solutions to be deployed, and train users to take advantage of them. An implementation may also involve integration with existing systems although many smaller companies choose to integrate PLM solutions relatively loosely in early implementation phases. However, the cost of implementation may become a barrier if solutions are too complex, require significant configuring, entail software modifications, or force companies to rethink business processes from scratch. While some companies are looking for fundamental transformation, other companies prefer smaller, incremental changes that provide short-term business value by showing a timely ROI.
- *Need to change business processes.* Change is hard. While no company should expect to achieve significant benefits without enacting change, many companies feel that they must conform to the business process built into the software. The greater the changes to business processes, the more effort required for training, documentation, and user acceptance. Often, SMEs must create a balance: changing processes that enable a business advantage, for example by implementing a best practice, but not changing other in-house practices that may be “good enough.”
- *Lack of internal resources.* Smaller companies may be able to approve funding for software and implementation, but then face roadblocks in assembling the appropriate project team. Implementing new solutions that help to enable a business change will not be effective unless users adopt them. Making business-knowledgeable employees available to help craft the new processes and determine how to use the software is important to ensure that new business processes fit the business. Typically, companies need to invest their top internal talent in the implementation in order to ensure a successful and beneficial result. While functional talent may be hard to commit to projects, SMEs may also lack the depth in technical resources required to implement a new solution. These resources, however, are more readily available from the outside because they do not need the same level of familiarity with the business and the industry as functional resources.

SMEs Find PLM Help

Fortunately for SMEs, software vendors and consultants have recognized the difficulties of implementation for SMEs and are providing tools and techniques to help reduce the overall change effort. AberdeenGroup identified the most popular methods that smaller companies used to meet their PLM goals and then conducted further analysis to determine which approaches were used by companies that are top performers in meeting product development goals (Figure 6).

Figure 6: Successful PLM Implementation Approaches



Source: AberdeenGroup, March 2006

AberdeenGroup found that best-in-class companies are taking advantage of implementation aids such as templates, adopting industry-specific solutions where available, and modifying solutions where required. In fact, these approaches were more common among the top performers than among other companies surveyed – indicating that these approaches improve the ability to use PLM to better meet product development targets.

- Workflow templates.* Many business processes that are a preferred approach to business have been labeled “best practices.” Some of these have been thoroughly researched and documented, such as CMII definitions for configuration management or Stage-Gate processes for new product development projects. Many times, these processes provide a standard starting point for smaller businesses with inconsistent processes or no formally defined process at all. For these companies, adopting a predefined process can save time and prevent political arguments over what the best practice is. Instead of defining a new best practice from scratch, companies can adopt or alter the template process.



- *Customized packaged solutions.* Many companies need to alter the base PLM package during implementation. Presumably these changes enable company best practices that provide a competitive advantage over the software provider's best practices. Alternatively, companies may customize the package to address specific industry capabilities or enable processes not supported by the solution. As an example, one company extended its solution to address regulatory compliance issues not yet supported by its vendor. As further analysis (Table 2, Chapter 3) indicates, although customization was the approach taken, it was not the desired approach for many.
- *Industry-specific solutions.* Solutions developed for specific industry requirements often provide better support for common industry processes than broadly targeted PLM solutions. Sometimes these processes are truly best practice for the industry; at other times they are simply the accepted norm. These solutions typically fit the distinctive workflow and "speak the same language" as the user, reducing the overall organizational change effort required to adopt them.
- *Templates for data configuration.* Product data management solutions readily capture, retrieve, and utilize product information; these are their core capabilities. However, many data management solutions provide significant flexibility and configurability for tailoring data structures to specific business needs. These templates give companies a starting point that leverages the vendor's cumulative customer experience, so that each SME does not need to rethink its overall approach, but can validate and change the existing process as needed.



Chapter Three: Implications & Analysis

Key Takeaways

- Best-in-class companies choose to adopt standard approaches and templates and modify them as necessary or adopt industry-specific solutions in order to reduce overall implementation efforts. More companies would have preferred these solutions than found them available, indicating a gap in SME enablers in some software solutions.
- Customization, which results in ongoing costs, may be a necessity for some companies. While best-in-class companies report creating custom enhancements to their solutions, many that customized did not desire to do so, indicating that this is not the desired, best practice approach.
- Best-in-class companies often choose hosted or software-as-a-service solutions rather than own and implement the software themselves, primarily to decrease the effort required for technical deployment.
- Best-in-class SMEs not only choose solutions that lower implementation barriers; they also are more likely to have a C-level executive, centralized organizational structures, and centralized control and coordination for product innovation and measure key performance indicators more often (at least monthly) and at the enterprise level.

SMEs Look to Reduce the Change Effort

The benchmark research reveals that the top SME challenges to PLM adoption are the cost of implementation, the need to change business processes, and a lack of internal resources available for the project. Together, these challenges represent the potentially high cost of organizational change. However, change is required in order to achieve the double-digit business improvements available to SMEs. As a result, these companies are looking for ways to adopt PLM solutions that require less effort.

Solution providers have recognized these challenges and are responding. Based on their customers' experience, vendors have been "packaging" best practices and data models for product innovation, product development, and engineering. They have also developed templates and preconfigured solutions that provide a starting point, so that smaller companies do not need to rethink their business from the ground up. Instead, these companies can validate a predefined solution and alter it only in areas which provide business value. The alterations may be to address industry or company uniqueness, or they may simply be a change required for user adoption, even if it is not best practice. Even when changes are required, solutions that provide best practices as a starting point reduce the need to develop processes from scratch, speeding implementation and time to achieve a return on investment.

Industry templates and industry-specific solutions can also play a significant role in speeding adoption and providing a better business fit. The more accurately the software



models the business, the better it can support users' work and provide them with trustworthy data. Industry solutions also offer an environment that is more familiar to users in terms of terminology and processes, so that they need less training and more readily adopt the solution in their daily practices.

In short, PLM product offerings that help smaller companies achieve the available benefits are emerging, leading to increased adoption by SMEs. *However, achieving value requires more than just PLM software. It also requires efforts to transform the organization and business processes, in combination with the underlying supporting technology.*

Organization, People, Metrics

Although appropriate solutions can reduce the organizational change required for successfully adopting PLM technologies, they aren't the whole story for improving product innovation, product development, and engineering processes. AberdeenGroup's *Product Innovation Agenda* identified the following characteristics of best-in-class companies:

- Best-in-class companies are more likely to have a C-level executive in charge of the full innovation process, including identifying product ideas, engineering them, and bringing them to market. In fact, 60% of best-in-class companies have a chief product officer, chief innovation officer, or the equivalent.
- Leading companies are more likely to have centralized organizational structures and product innovation strategies that centrally control and coordinate product innovation, with three-quarters of the best-in-class having at least centralized coordination, if not centralized control.
- Best-in-class companies varied from the industry norm significantly in measuring performance. They were three times more likely to measure key performance indicators (KPIs) on at least a monthly basis and about 50% more likely to measure them on an enterprise level than the industry norm. In contrast, laggards typically do not measure KPIs consistently and tended to measure them on an ad-hoc basis, if at all.

Business Processes

Best-in-class SMEs are adopting PLM solutions that reduce implementation barriers. These companies are adopting predefined best practices, utilizing data configuration templates, and taking advantage of industry-specific solutions. The key to successful implementation for these companies is not to start from scratch or "reinvent the wheel." Instead, they choose to adopt standard approaches and modify them when required.

AberdeenGroup compared the solution implementations aids that SMEs used with what they would have liked to use and found some relatively significant gaps (Table 2), leading to the following observations based on the research results:

- Half of the companies that customized packaged solutions did not want to do so. Customization may provide advantages, but also produces long-term costs that need to be considered. Besides the initial cost, there are additional costs throughout the life of the customization because it must be supported, maintained, and re-implemented when new releases are installed. While many best-in-class companies have customized their solutions, this fact does not indicate that customization is best practice; it may be a necessity in some circumstances.

- Industry-specific solutions and industry templates both scored highly as desired solutions. Many more companies would have used industry templates if they were available. Frequently, choosing between an industry template and an industry-specific solution involves a tradeoff in regards to vendor size and scale. Many providers offering industry-specific solutions are smaller organizations that do not have the same level of resources as vendors providing templates. Their resources, however, are typically more focused on the industry support, making the choice between templates and specialty solutions difficult.

Table 2: SME Implementation Aid Gaps

	Wanted	Used
Industry-specific Solution	25%	23%
Templates for Data Configuration	25%	18%
Industry Templates	22%	7%
Custom Solution	22%	30%
Customized Packaged Solution	12%	25%

Source: AberdeenGroup, March 2006

Enabling Technology

From a technology perspective, we have shown that companies choose solutions that provide a better fit for their business and lower barriers to adoption. AberdeenGroup also analyzed how SMEs deployed the technology. In particular, survey respondents indicated that they had implemented their PLM solutions by the following methods:

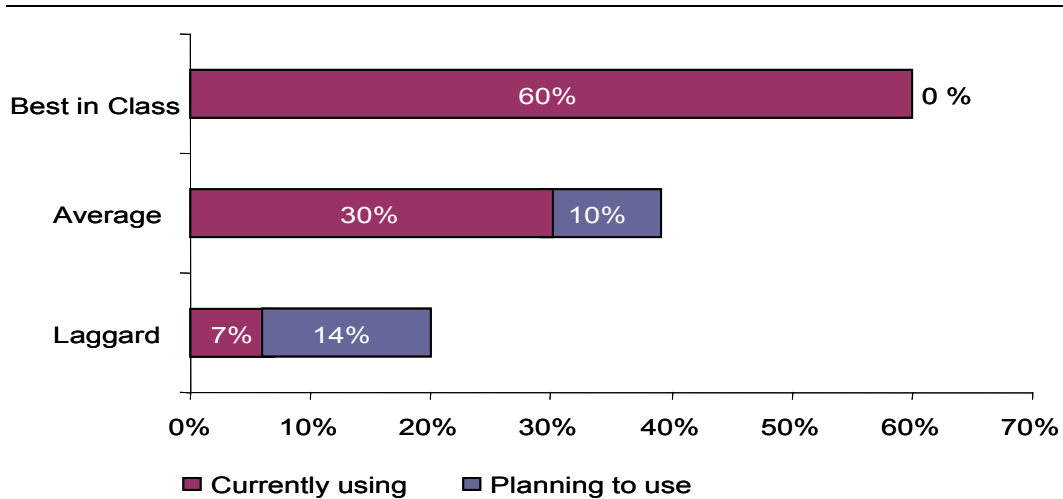
- *Traditional method.* The company owns the software, implementing it in-house on its own technical infrastructure.
- *Hosted solution.* The company owns the software, but it is hosted on someone else’s technical infrastructure.
- *Software as a service.* The company does not own the software or infrastructure and pays a monthly fee for access to the software solution

Just as SMEs are seeking to reduce the hurdles to functional adoption of the software, they are also looking to decrease the effort required for technical adoption. By using hosted or software-as-a-service (SAS) solutions, they can replace internal technical resources to implement and support the solution with an outsourced function. Aberdeen-



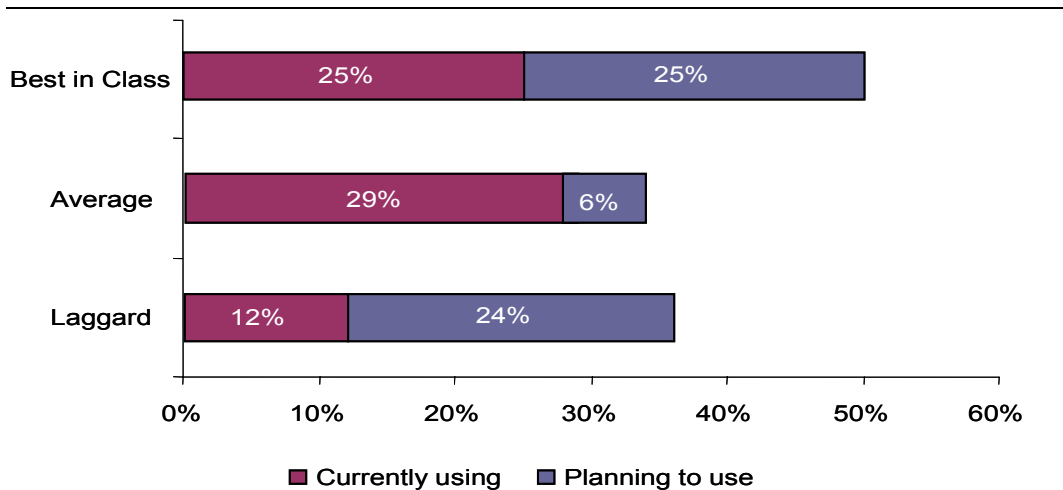
Group found that best-in-class companies – in other words, those companies that are best meeting their product development goals – are using hosted (Figure 7) and SAS solutions (Figure 8). It should be noted that some companies may be using multiple approaches, with different applications within their PLM suite being deployed in different ways.

Figure 7: Use of Software-as-a-Service Solutions for PLM



Source: AberdeenGroup, March 2006

Figure 8: Use of Hosted Solutions for PLM



Source: AberdeenGroup, March 2006



Chapter Four: Recommendations for Action

Key Takeaways

- Educate the business on the value of PLM.
- Pick the right starting point and develop a logical PLM program.
- Look for implementation aids such as templates to reduce implementation effort.
- Look for industry-specific capabilities that meet specific business needs.
- Include organizational, process, and performance measurement considerations in the PLM initiative in addition to software.
- Consider hosted or software-as-a-service solutions to reduce requirements for technical resources.
- Act to take advantage of the PLM opportunity.

PLM solutions offer significant benefits for small to medium-size manufacturers. In fact, many companies are recognizing their value, leading to an increased PLM adoption rate by SMEs. PLM offerings designed for SMEs can lower the barriers for functional and technical adoption. But not every company that is seeking these implementation enablers has been able to take advantage of them. Nonetheless, manufacturers should continue to seek these tools and ask their vendors for them. In addition, SMEs that are looking to adopt PLM should consider the benefits of reducing technical barriers to implementation through hosted solutions or software as a service.

The following recommendations are intended to help small to medium-size manufacturers take action and seize opportunity that PLM provides to improve product innovation, product development, and engineering processes to improve corporate-level business performance. Specifically, SMEs should take the following actions:

- Educate themselves on PLM. Many small to medium-size companies reported that they do not have a good understanding of PLM. In particular, survey respondents indicated that their understanding of PLM decreases when they consider the implications of PLM outside of departmental and company boundaries, in the supply chain.
- Pick the right starting point. PLM solutions encompass design tools, analysis solutions, product development enablers, portfolio management solutions, and other valuable capabilities. SMEs should develop a strategy to implement these solutions step-by-step, first picking a relevant and high-impact business problem that they can solve and implementing a solution to that problem as a foundation on which to build their full PLM solution.



- Look for PLM solutions that provide templates for common business processes. Smaller companies typically do not have the resources to rethink every business process in an attempt to improve it. Instead, they should adopt best practices where available and then modify them in areas in which they can attain tangible business value.
- Seek solutions that fit their industry, through specialized solutions or industry templates. Software that provides a better fit with the business can better support business processes, leading to more rapid user adoption. Solutions that address common needs, incorporate standard industry practices, and offer industry-specific terminology provide a more comfortable solution environment for users. These capabilities may need to be balanced against vendor size and scale, however, because industry-specific vendors may have less (although more focused) resources.
- Include organizational, process, and performance measurement considerations in their PLM strategy in addition to technology considerations.
- Consider hosted or software-as-a-service solutions to reduce the technical barriers to PLM adoption. These implementation approaches can reduce the resource requirements from internal technical resources, which may already be stretched in many smaller businesses.
- Take advantage of the PLM opportunity to achieve tangible improvements. SMEs that do not adopt PLM will be at a competitive disadvantage.



Author Profile

Jim Brown
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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 January and February 2006, [AberdeenGroup](#) examined the product innovation, product development, and engineering processes, strategies, and approaches – along with PLM solution experiences – of more than 150 small to medium-sized enterprises in various manufacturing industries.

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

- The challenges and complexities they face in developing innovative, profitable products
- The benefits, if any, they are receiving from improving product innovation, product development, and engineering performance using PLM software
- The challenges they face when implementing PLM solutions
- The approaches they have taken to overcome PLM implementation challenges
- Current and planned use of PLM solutions to foster innovation capabilities and activities

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

The survey augmented SME survey data collected in July and August 2005 for [AberdeenGroup's Product Innovation Agenda](#) report, and aimed to identify the unique challenges that SMEs face when implementing PLM solutions, and the successful approaches they have adopted to gaining the value of PLM.

Responding enterprises included the following:

- **Job title:** The research sample included respondents with the following job titles: director or manager (48%), senior management (15%), senior vice president (7%), engineer (8%), internal consultant (7%), CIO/IT Leader (5%), staff (5%), and other (5%).
- **Job function:** The research sample included respondents from the following functional areas of responsibility: Information Technology (21%), Engineering (17%), Business Process Management (11%), Marketing (10%), Manufacturing Engineering (7%), Sales (7%), Manufacturing (6%), Logistics/Supply Chain (5%), Procurement (3%), Finance (3%); and others, including Quality Assurance, Customer Service, and Regulatory/Compliance (10%).
- **Industry:** The research sample included respondents predominantly from manufacturing industries. At a high level, the respondents represented discrete manufacturing (57%), consumer products (26%), and process manufacturing (17%). From a more detailed perspective, the industries represented were widely varied.



Industries that were more highly represented included industrial equipment manufacturing (15%), high technology (10%), and automotive (10%).

- **Geography:** The majority of study respondents were from North America (74%), with other representation from Europe (16%) and Asia Pacific (Asia, Australia) (8%). The remaining respondents were from the Middle East or Africa.
- **Company size:** About 43% of respondents were from medium-size enterprises (annual revenues between \$50 million and \$1 billion), 35% were from small businesses (annual revenues of \$50 million or less), and 32% were from large enterprises (annual revenues of more than \$1 billion U.S.).

Solution providers recognized as sponsors of this report were solicited after the fact and had no substantive influence on the direction of *The PLM for Small to Medium-Size Manufacturers Benchmark Report*. Their sponsorship has made it possible for AberdeenGroup to make these findings available to readers at no charge.



Appendix B: **Related Aberdeen Research & Tools**

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

- [*The Product Innovation Agenda Benchmark Report*](#) (September 2005)
- [*The Global Product Design Benchmark Report*](#) (December 2005)
- [*Mid-size Manufacturers Struggle with Global Product Design*](#) (March 2006)
- [*Enabling Product Innovation: Roles of ERP and PLM*](#) (November 2005)
- [*The Design for Compliance Benchmark Report*](#) (November 2004)
- [*Product Innovation for Mid-size Enterprises*](#) (November 2005)
- [*Leading Compliance with Product Design: A Mid-Market Perspective*](#) (February 2005)

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



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Our Mission

To be the trusted advisor and business value research destination of choice for the Global Business Executive.

Our Approach

Aberdeen delivers unbiased, primary research that helps enterprises derive tangible business value from technology-enabled solutions. Through continuous benchmarking and analysis of value chain practices, Aberdeen offers a unique mix of research, tools, and services to help Global Business Executives accomplish the following:

- IMPROVE the financial and competitive position of their business now
- PRIORITIZE operational improvement areas to drive immediate, tangible value to their business
- LEVERAGE information technology for tangible business value.

Aberdeen also offers selected solution providers fact-based tools and services to empower and equip them to accomplish the following:

- CREATE DEMAND, by reaching the right level of executives in companies where their solutions can deliver differentiated results
- ACCELERATE SALES, by accessing executive decision-makers who need a solution and arming the sales team with fact-based differentiation around business impact
- EXPAND CUSTOMERS, by fortifying their value proposition with independent fact-based research and demonstrating installed base proof points

Our History of Integrity

Aberdeen was founded in 1988 to conduct fact-based, unbiased research that delivers tangible value to executives trying to advance their businesses with technology-enabled solutions.

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