

PLM Technology Adoption in Apparel: Turbo-Charging Investments for Fast Fashion

by Janet Suleski, Jeffrey Hojlo, and Michael Burkett

Feeling the pressure to deliver more styles in less time, apparel manufacturers and retailers are more frequently turning to off-the-shelf PLM applications as the scalable platform needed to support increasingly complex product development processes in the context of business-led supply chain strategies.

© Copyright 2007 by AMR Research, Inc.

AMR Research[®] is a registered trademark of AMR Research, Inc.

No portion of this report may be reproduced in whole or in part without the prior written permission of AMR Research. Any written materials are protected by United States copyright laws and international treaty provisions.

AMR Research offers no specific guarantee regarding the accuracy or completeness of the information presented, but the professional staff of AMR Research makes every reasonable effort to present the most reliable information available to it and to meet or exceed any applicable industry standards.

AMR Research is not a registered investment advisor, and it is not the intent of this document to recommend specific companies for investment, acquisition, or other financial considerations.

This is printed on 100% post-consumer recycled fiber. It is manufactured entirely with wind-generated electricity and in accordance with a Forest Stewardship Council (FSC) pilot program that certifies products made with high percentages of post-consumer reclaimed materials.

PLM Technology Adoption in Apparel: Turbo-Charging Investments for Fast Fashion

by Janet Suleski, Jeffrey Hojlo, and Michael Burkett

The apparel industry recognizes the benefits of adopting packaged PLM applications to speed time to market, but opportunities remain to link PLM and broader supply chain activities.

The
Bottom
Line

Executive Summary

Coordinating the iterative process of design and sourcing new products across a global supply chain is a daunting task when managed in an environment of spreadsheets, especially when manufacturing operations are distributed and outsourced across a network of suppliers in low-cost regions. Feeling the pressure to deliver more styles in less time, apparel manufacturers and retailers are evaluating product lifecycle management (PLM) applications as a more scalable platform to support complex product development processes. As a result, early adopters are slashing cycle times by 50% or more. See “PLM for Apparel, Footwear, and Soft Goods: Meeting the Demands of New Product Introduction” for an evaluation of PLM software vendors providing applications to apparel companies today.

The following are four key findings from the 2007 survey on spending on PLM technology in the apparel industry:

- PLM is rapidly becoming part of apparel companies’ broader supply chain strategies.
- Business leadership has overtaken IT leadership of PLM technology projects.
- Packaged PLM applications are now the answer.
- Leaders move to the next stage of profit maximization by linking PLM to sourcing, procurement, and collaboration processes.

Time to market drives PLM investments

Time to market remains the top driver of PLM investment, according to one-third of companies responding to AMR Research and *Apparel* magazine's second annual survey on the state of PLM technology adoption in apparel. This is not surprising, considering industry leaders report significant improvements in key metrics that result from faster time to market:

- Higher inventory turnover—five to seven times
- Net margin improvement—15% to 20%
- Greater full-price sell through—more than 80%
- Comparable store sales increase—10% to 12%
- Shopper frequency increase—12 to 17 times per year

Leading apparel companies have quickly taken a page from the handbook of their counterparts in other industries, where automotive, aerospace, and discrete manufacturing companies have long used PLM to support global design teams. Consider the high-tech industry, where evolving business models were the catalyst for change that drove PLM investment as companies moved to a dependency on outsourced contract manufacturers.

Apparel manufacturers and retailers have unique challenges. For example, one manufacturer needed to coordinate a high rate of change with global partners across 23 calendars on 10,000 materials and 500,000 samples each year. Hitting the market quickly with new fashions allows retailers to capture premium prices, but managing cost and quality are the keys to achieving consistently high margins. Apparel manufacturers, brands, and retailers are looking to PLM as a foundation to support both in their pursuit of sustainable and profitable growth.

Defining the PLM footprint in apparel

With increased interest in PLM technology, many conflicting descriptions regarding the functional PLM footprint exist. We do not view PLM as a new business model or process, but rather as a business strategy with a set of enabling functionality to support an organization's new product development and introduction (NPDI) process. Based on this approach, we define PLM for the apparel industry as follows:

- **Product data management (PDM) and specification management**—These data-centric processes revolve around the management of all the critical product, material, and component data needed to build a bill of materials (BOM), ultimately creating a complete specification package for the manufacturer. Specification management includes major components such as measurements and grading, construction details, CAD, or sketch files, and may include costing details.

- **Line planning**—Line plans define the templates for how many items or styles will be created, including color and size definitions, for each product category. Line plans also form the basis for organizing products across the functional teams that must interact with the NPDI process, as well as provide a view of the critical financial elements for products and link to the assortment planning process.
- **Collaborative product design**—Many design departments begin seasonal activities by creating themed storyboards depicting the trends that will influence the line and individual styles. Creating an electronic version of these typically offline creations, usually in a CAD or an illustration application, allows designers, technical designers, and trading partners to review, mark up, and comment on images in a collaborative manner without jeopardizing the integrity of the native file.
- **Development process management**—This encompasses the many critical development activities and approvals that must occur before the completion of a specification. Raw material development and approval, lab dips, sample approval, and performance testing are just some of the elements many companies currently track and control manually or in Excel spreadsheets. PLM applications provide version control and dynamic process visibility while reducing the risks associated with e-mailing Excel files.
- **Workflow, calendar, and event management**—Calendars provide the major milestones and timelines associated with the seasonal development cycle for each product category. As companies create timelines, calendar and event management functionality uses milestones and dates to track the status of each individual product or development activity against the deadline, displaying the status at any point in time. Workflow functionality overlays the individual or role ownership for each task or event and provides a vehicle for routing alerts and notifications that a particular event is complete or needs action.
- **Trading partner collaboration**—This functionality enables secured access to data by outside trading partners that participate in the development process. This could include the shared entry of material or product data, the review and receipt of product specifications, collaboration on requests for quotation, and the ability to support joint development activities.

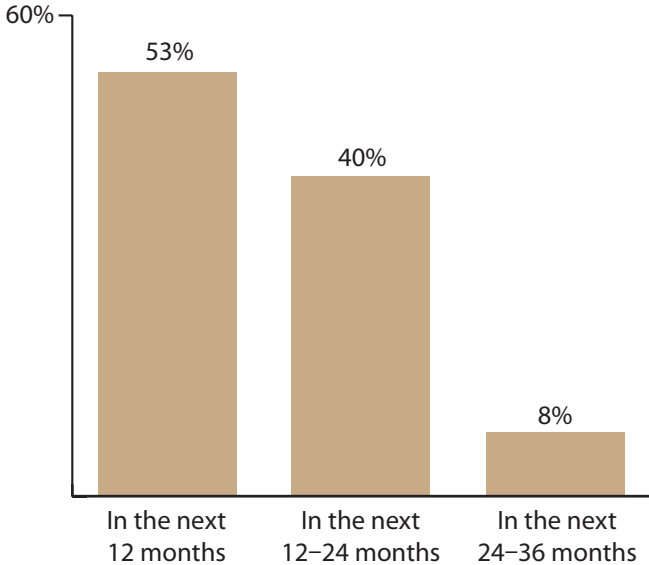
PLM technology designed for apparel companies was lacking until a few years ago, and many software vendors continue to enrich portions of the functionality listed above to satisfy user requirements. Apparel companies did not offer the most lucrative opportunity for software vendors, as the industry as a whole lagged behind in adopting packaged technologies. But now apparel manufacturers, wholesalers, and retailers are eagerly evaluating the packaged applications available to them, as the business imperative to reduce product development through improved internal and external data sharing and collaboration grows.

PLM is part of the broader supply chain strategy

Based on the survey, retailers and apparel manufacturers plan to make the bulk of PLM software investment in the next 12 to 24 months, and many are coordinating PLM with sourcing processes (see Figure 1). The following results show that companies are streamlining the entire NPDI process:

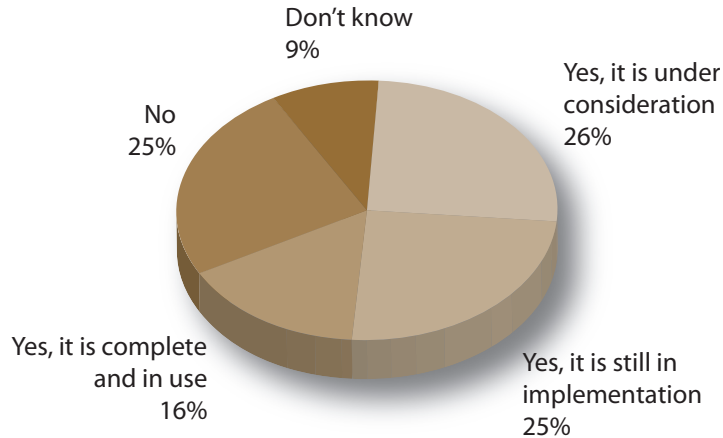
- 34% still do not consider PLM as part of their supply chain strategies, but this number is significantly lower than the 58% of participants from last year’s survey.
- 16% already include PLM as part of their supply chain or IT strategies, versus 9% last year.
- 25% are now in the process of including PLM in their supply chain strategies, up from 9% last year.

Figure 1: Planned timeline for future PLM investments



Source: AMR Research, 2007

Figure 2: PLM as part of supply chain or IT strategy



Source: AMR Research, 2007

Companies are evolving the definition of supply chain. While in the past supply chain was focused on logistics—getting material to the right place at the right time—we now see a greater emphasis on supplier management. Manufacturers increasingly see PLM as an enabler of effective supplier management and sourcing, a critical component of the supply chain to maximize PLM investments by tightly integrating NPDI with supply chain execution.

The broader connection to a demand-driven supply network (DDSN)—that is, using customer and market insights to drive and shape the development of new products—is still coming into focus for apparel retailers and manufacturers. See “The Handbook for Becoming Demand Driven” for more information on demand-sensing and demand-shaping tactics that manufacturers in particular are using to drive innovation in their businesses.

To close the loop between demand sensing and product creation, innovative apparel companies create strong links between intelligence derived from consumer-centric merchandising and product development to ultimately drive demand by designing products that consumers are likely to purchase. In our conversations with retailers over the past year, we uncovered best-practice examples of companies instituting processes to capture customer insight:

- Creating incentives for store associates to capture customer data.
- Using customer loyalty data to establish prices, promotions, and products that resonate.
- Collecting input from salespeople who have their fingers on the pulse of the market.
- Linking merchandising and product development groups.

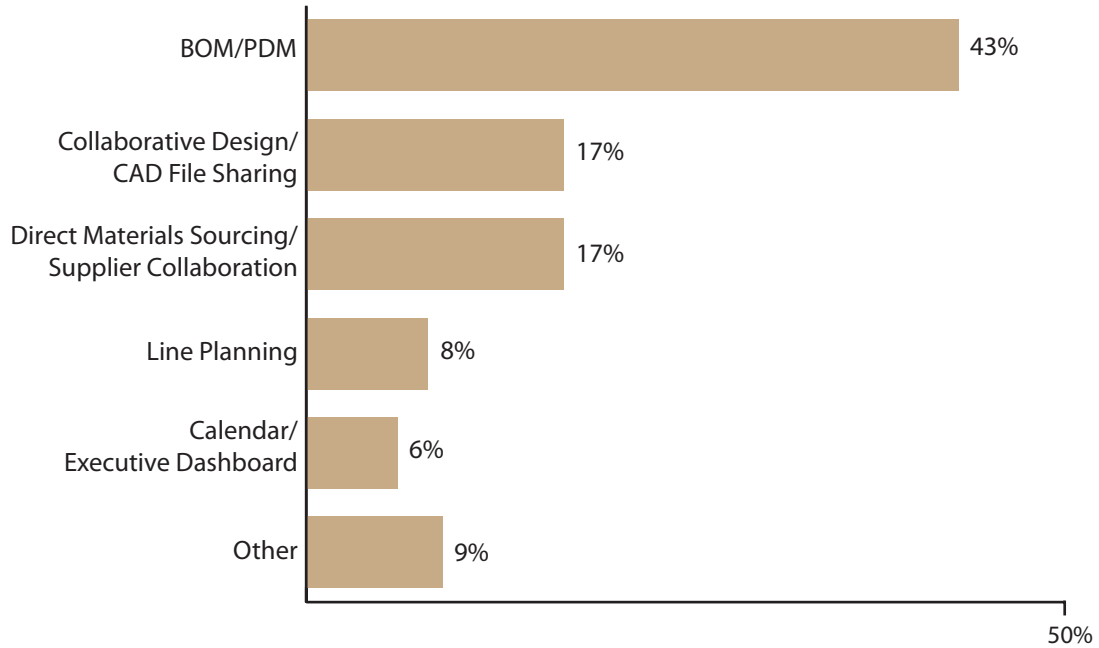
Product and services innovation is a central theme of demand-driven retailing, with new products and services as the main source of new profit and growth for apparel companies (see “The Retail Handbook for Becoming Demand Driven”). Most companies use systems like **Microsoft** Office or homegrown applications to manage the flow of new product ideas. Few have a robust, cross-organizational system to manage this early stage of new product development, where merchandising, design, and supply chain collaborate around new concepts and line plans. Many PLM systems have functionality to choreograph formerly sequential activities, such as ordering material, finalizing designs, and creating spec packs, into parallel processes.

Early PLM efforts focus on product data management

PDM is the foundation for PLM projects at apparel companies. Getting data under control is most often the first order of business when deploying PLM, with 43% of manufacturers identifying this as the current scope of their implementations (see Figure 3). These figures are consistent with last year’s results: 38% of companies indicated that PLM rollouts would begin with PDM. The consistency reflects the emphasis companies place on getting product development data cleansed and centralized to create a foundation for more strategic product-planning activities. PDM provides a standard library of materials and components that deliver lower costs and improved quality through improved reuse. For global organizations, it is core to keeping the extended product launch team armed with the most up-to-date specifications.

Two forms of supply chain data sharing—direct material sourcing and collaborative design or CAD file sharing—account for 17% of current PLM efforts. Many software vendors that now provide broad PLM capabilities began with a focus on PDM or CAD design tools and have added PLM functionality in recent years, accounting for initial PLM footprints that include these capabilities. A second group of vendors have approached the PLM challenge from the perspective of direct materials sourcing, supported by sourcing visibility, related workflow, and calendaring capabilities. Both sets of vendors are adding executive dashboards and line planning functions to existing suites, which gets them attention from more advanced adopters of PLM.

Figure 3: Current scope of PLM effort

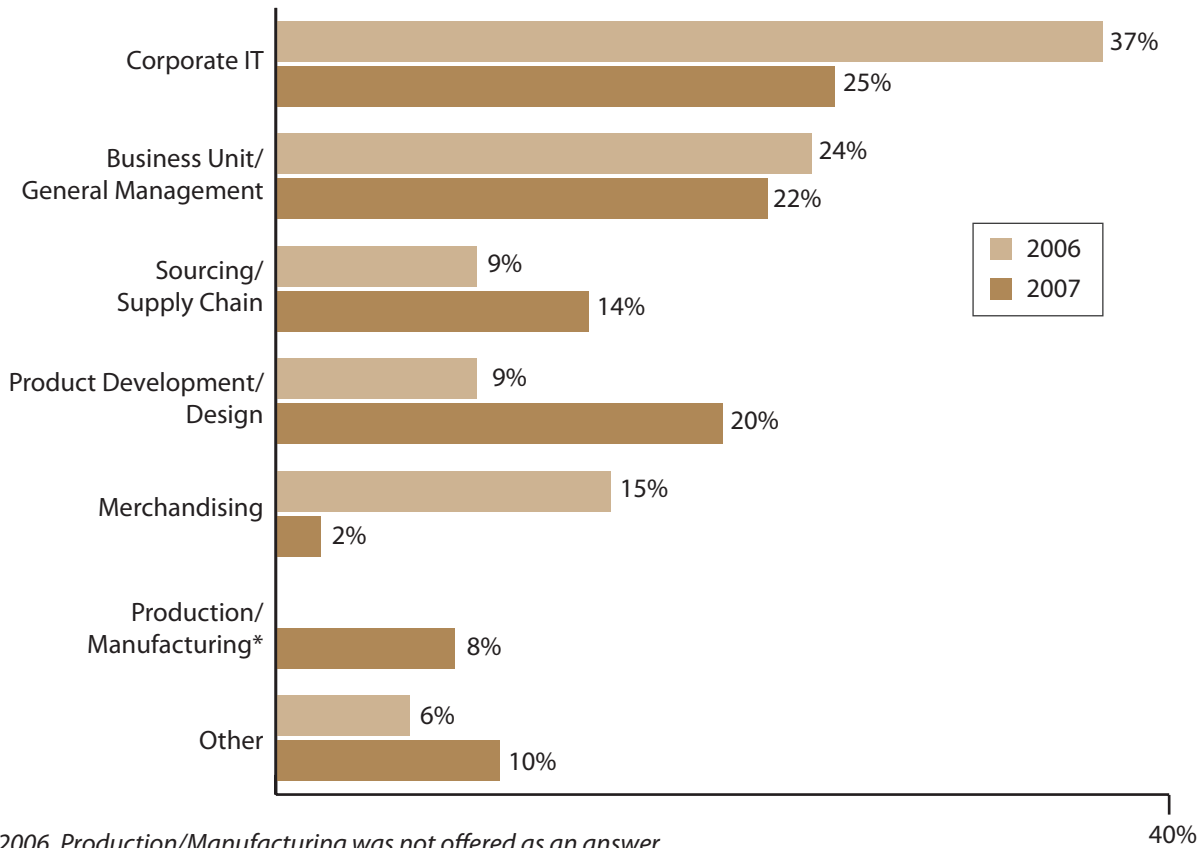


Source: AMR Research, 2007

Business overtakes IT in PLM project leadership

Line-of-business (LOB) owners clearly see PLM's role in improving their competitiveness and are taking a more active role in leading implementation efforts. According to this year's survey, IT leads PLM projects for 25% of participants, down from 37% last year. Supply chain and sourcing professionals increased their leadership to 14% from 9% over the last year. This shift emphasizes the importance of supply chain coordination for improving time to market. Meanwhile, product development leadership more than doubled to 20% as these teams recognize the need for more effective innovation strategies (see Figure 4).

Figure 4: Leading the charge of PLM effort



*In 2006, Production/Manufacturing was not offered as an answer.

Source: AMR Research, 2007

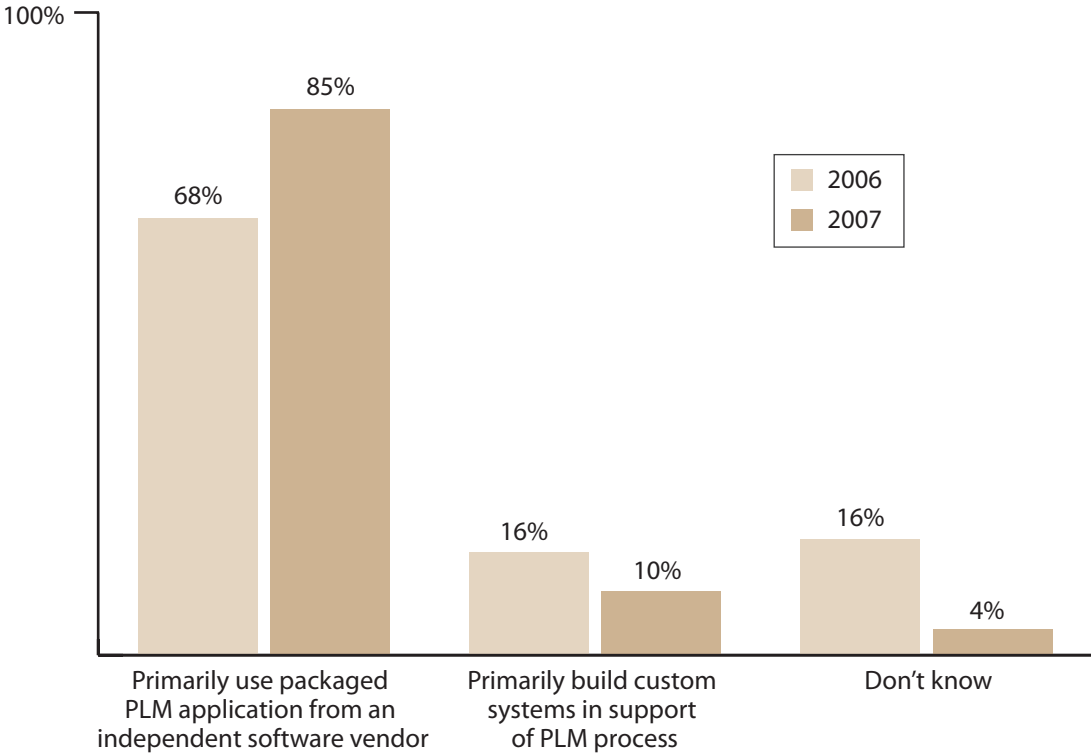
Early PLM efforts often started as technology projects with the goal of putting data into a single location, but failed to achieve the potential business value because of poor organizational involvement. As collaboration with offshore and upstream partners has become increasingly important to reducing cycle time while bringing hot products to market, business leaders responsible for broader value chain agility have taken on active roles in PLM initiatives. While PLM technology has become one of several tools for achieving business-led initiatives, successful PLM efforts cannot be treated as a technology implementation alone.

Custom applications are out, packaged applications are in

As leadership has moved to the business side, the view of PLM as a homegrown IT project has shifted as well. Last year 68% of companies were pursuing commercial off-the-shelf (COTS) applications, but this year the number has grown to well over 80%, signaling a desire for fully supported PLM applications that provide a foundation to the business (see Figure 5). When LOB owners become dependent on PLM as a critical infrastructure component, they seek out applications that are fully supported by a partner from a technology and services standpoint.

Early on, many global PLM implementations in apparel and footwear were built by software vendors on their existing applications originally designed for other industries. As a result, they lacked some specific functionality required by apparel companies. After several years of learning industry requirements from these early adopters, the software providers now have apparel-specific templates and workflows that require little customization. Meanwhile, many of the vendors that have served the apparel design space for well over a decade are responding to customer demand for scalable PLM and to the increased competition entering the market by adding calendars, line planning, and global PDM capabilities. Combined, these factors make packaged applications increasingly more attractive to apparel companies.

Figure 5: Technology approach

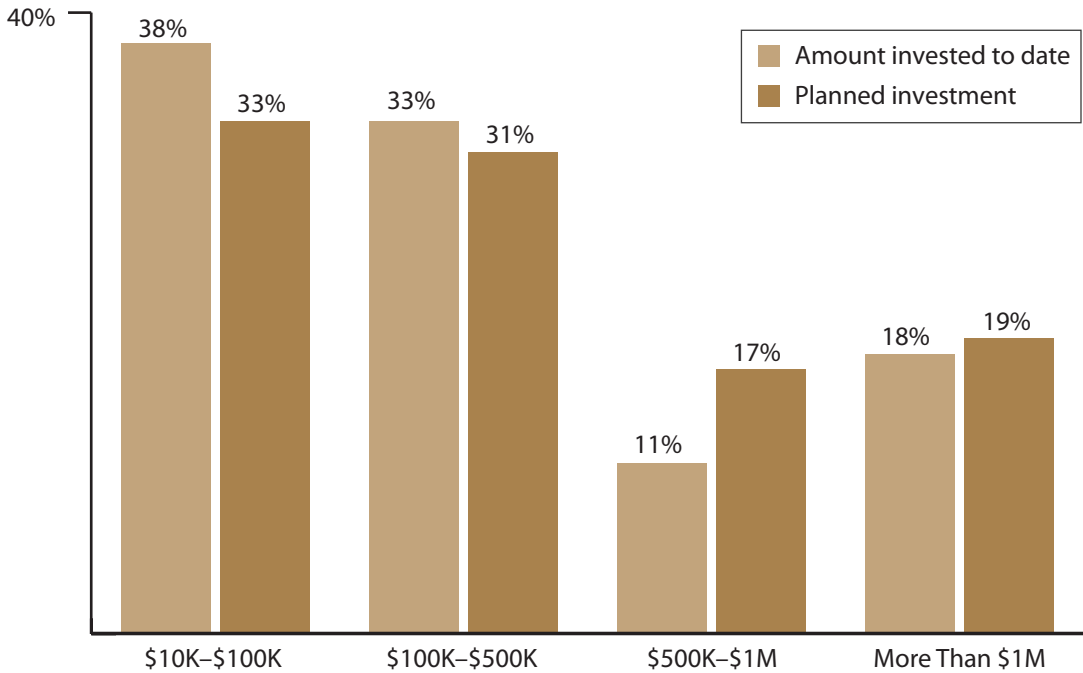


Source: AMR Research, 2007

PLM spending plans get real, while ROI expectations go higher

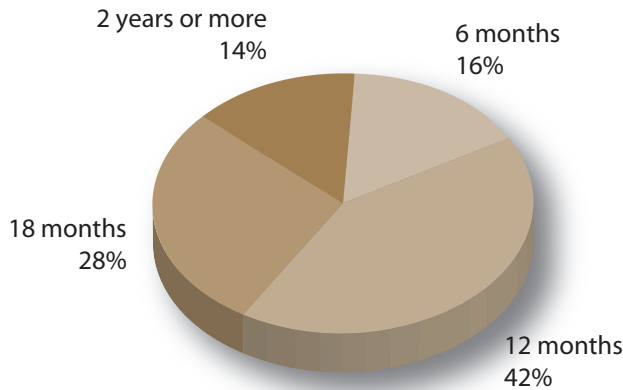
Although current PLM system investments per responding company are primarily below \$100K, many more plan to spend more than \$500K on adding to their PLM software footprints. In fact, 19% of respondents plan to spend over \$1M (see Figure 6). A remarkable 58% of respondents want an ROI within a year, while last year most expected a return in one to two years (see Figure 7).

Figure 6: Current and planned level of PLM investment



Source: AMR Research, 2007

Figure 7: ROI expectations—time frame



Source: AMR Research, 2007

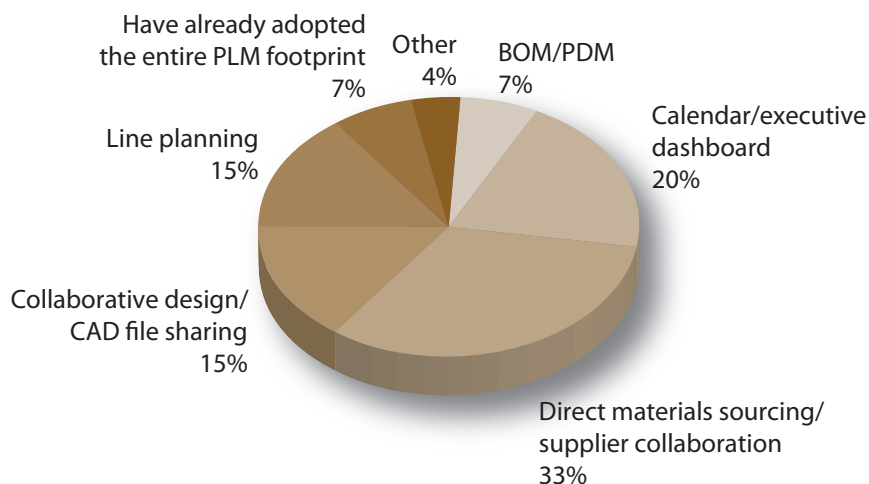
Expected time to ROI is shorter in apparel than in other industries. This is not an unreasonable expectation. PLM applications affect multiple seasons and many items per year for an apparel manufacturer. Many small savings in time and materials, or having one additional week of a product in the store during a specific season, may generate ROI quickly over the course of 6 to 12 (or more) style seasons over a year. Responding to increased global competition and ever-changing consumer trends will also drive faster ROI. For these reasons, companies are willing to spend more for applications that have increased functionality while offering relatively short deployment time frames.

The other reason for planned spending increases goes back to the shift away from IT toward business unit management for these projects. In other words, PLM is becoming more strategic to the business receiving attention at the executive levels within apparel retailers and manufacturers. The investment level is beginning to reflect the weight being placed on PLM as a strategy and technology to address important business issues.

As deployed functionality expands, apparel companies expect PLM benefits from many sources

PLM to retailers primarily means managing and speeding the delivery of specifications to the right people throughout the NPDI process (that is, PDM). It is less about the design alone, with just 15% planning to use their PLM applications for collaborative design (see Figure 8). Retailers and apparel manufacturers use PLM systems to maintain revision history, connect with the line plan, and draw on standard materials for color and trim. Design is typically handled via the free-form processes that have always been in place, like whiteboarding, CAD, or illustration applications—a reminder that designing a shirt or a pair of pants is still a creative process. This doesn't mean PLM applications can't be used for design, but instead that designers are content with the existing processes in place with which PLM systems need to integrate.

Figure 8: Planned scope of PLM effort in next 12 to 18 months

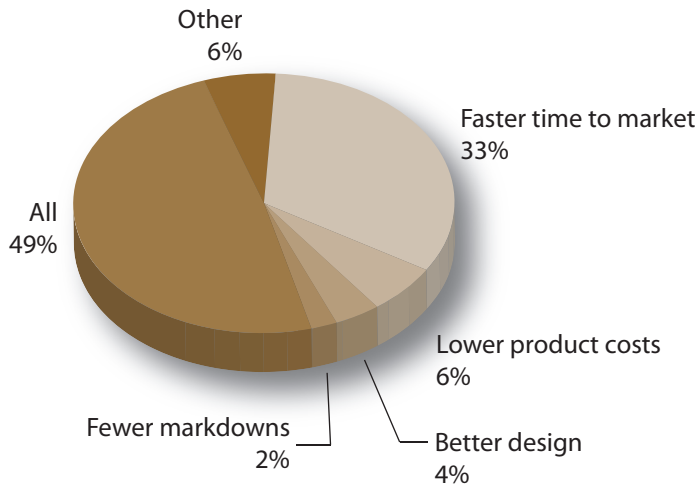


Source: AMR Research, 2007

Respondents also are expanding their PLM footprints to direct material sourcing and supplier collaboration. With leadership of PLM projects shifting to business leaders, the level of support for making logical process links increases. One-third of companies plan to extend PLM technology to these areas within the next 12 to 18 months.

In 2006, 21% of survey respondents stated that lower product costs were a primary business benefit achieved or expected from implementing a PLM system, while 23% named faster time to market as the primary benefit. In 2007, we saw a shift in expected benefits toward faster time to market (33%) and away from lower product costs (see Figure 9). The shift, much like the design number, is because of respondents allocating their answers to “all,” a reflection of increased expectations being placed on PLM systems.

Figure 9: Primary benefits of PLM system hoped for or achieved



Source: AMR Research, 2007

Leaders are moving to the next stage of profit maximization

The leaders that have made an initial PLM investment are now building on that foundation to further improve their new product launch processes. After manufacturers create a data management foundation, they build on it to automate processes and improve visibility for decision making. This year’s survey reflects that trend, as projects extend into the following areas:

- **Direct material sourcing and supplier collaboration**—Growing the PLM footprint into sourcing is the next priority for companies; 33% state this will be their next phase of implementation over the next year (again see Figure 8). This natural extension of the original PDM foundation supports a number of processes with suppliers, including request for quote, total landed cost analytics, and workflow tracking of product sample quality checks.
- **Collaborative product design and line planning**—These two areas tie for the second most important next step after PDM for 15% of respondents. While coordinating the sourcing process is a major bottleneck to time to market, collaborating on designs and line plans is where the innovation and market alignment decisions take place. Getting the cross-functional teams of merchandising, design, and supply together allows faster iterations of design ideas to ensure market trends are satisfied. Streamlining the design process, in addition to leveraging reusable material and component specifications, will reduce the design cycle component of total time to market.

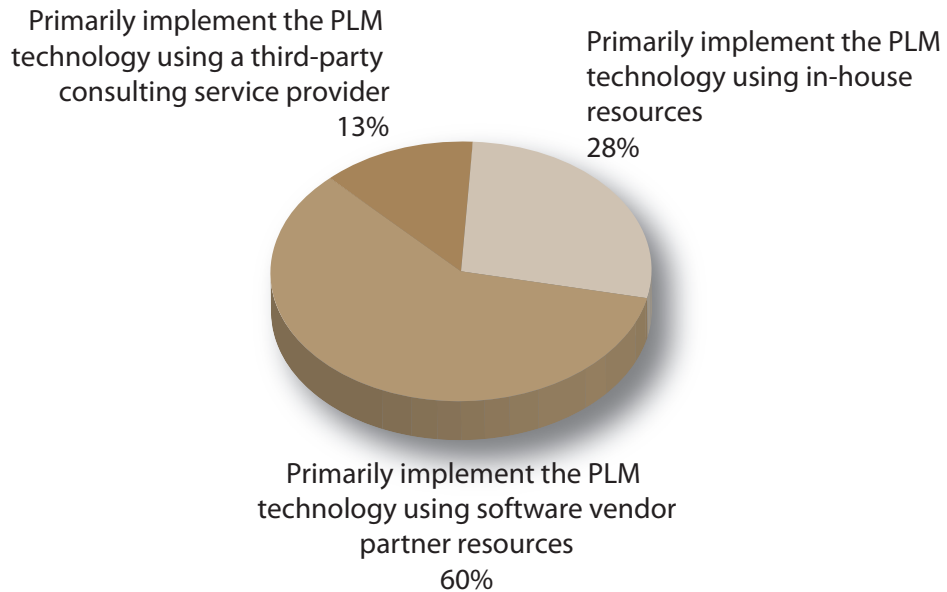
Laying the initial PDM foundation achieves the first step toward PLM benefits by providing a single version of product information, but the greater impact comes from operational improvements and achieving strategic business goals. Reducing operational costs and improving quality through business process improvements tangibly affects the bottom line beyond infrastructure savings. Meanwhile, making the business more responsive to market opportunities provides a strategic competitive advantage that cannot be overlooked.

Extending PLM requires process flow across organizational and technology silos

As companies progress along their PLM journeys, they move from the initial PDM data repository to the more complex area of business process flow. This creates a paradox, since NPDI is inherently a cross-functional business process, but assigning ownership and achieving consensus across these functions can be one of the greatest obstacles to getting the full value from PLM. Beyond the organizational interaction required, PLM must also integrate with other technologies such as sourcing and procurement, financial systems, and supply chain visibility systems to complete a business process flow.

To satisfy the organizational and business process changes required, companies look to external parties for the consulting services needed. The most successful implementations typically have a core team consisting of IT, business liaisons, and external experts. While there are independent consulting firms available to provide support, the survey indicates that 60% of companies look to their software providers to obtain these services (see Figure 10). This approach provides the advantage of having a single partner responsible for total business success. However, since many vendors are either new to apparel or fairly small, manufacturers should take care to ensure their software providers have sufficient expert staff to scale to their needs.

Figure 10: Implementation approach

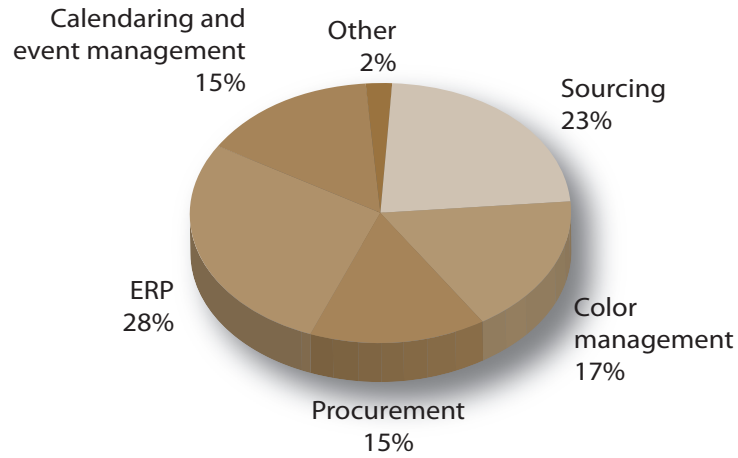


Source: AMR Research, 2007

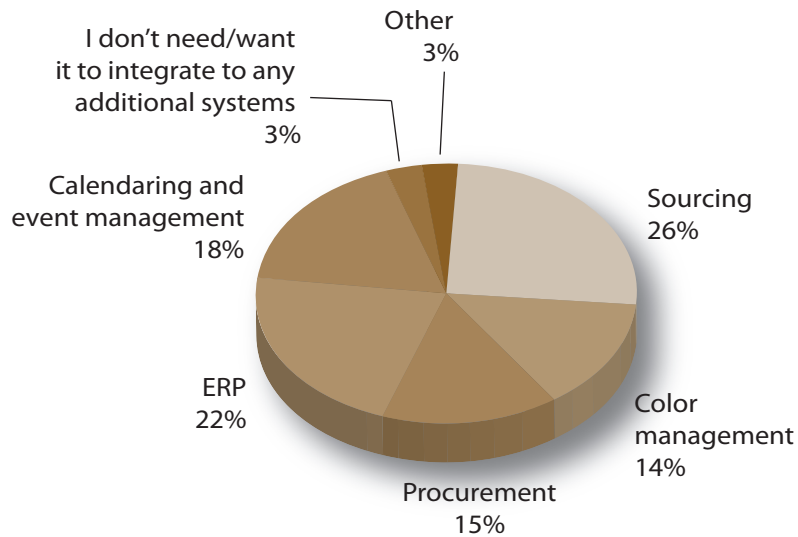
PLM applications provide a robust foundation to support the new product launch process, but other systems share data both upstream and downstream. One of the primary steps in reducing time to market is to eliminate redundant data entry between applications and improve the consistency of information shared throughout the organization. As a result, openness of the applications should be a priority for any PLM application selection to support integration to these other systems. ERP tops the list of existing integrations, as 28% of respondents completed this task (see Figure 11). For those with additional integration plans, sourcing is the priority, with 26% stating this is next on their lists. Other systems on the future integration list include calendaring, procurement, and color management.

Figure 11: PLM system integration touchpoints—current and desired

Systems to which PLM application(s) currently integrate



Systems to which companies would like to integrate their PLM systems in the future



Source: AMR Research, 2007

Conclusion

The survey findings show that PLM technology is a key enabler of improved speed to market. As we learned, early implementations are sometimes siloed, held outside of larger supply chain processes. With ownership shifting to business process leaders, PLM takes its rightful place as part of NPDI activities interfacing with supply chain execution. Packaged software is rapidly overtaking custom applications as the tool of choice to close the gap between existing and best-in-class PLM business practices. As technology investment rises, we recommend a focus on two best practices:

- **Ensure your PLM project is staffed with knowledgeable talent from either your software vendor partner or a third-party consultant.** Business owners' expectations for ROI are high. Commitment for funding the adoption of PLM applications is a sign of how seriously the business is seeking the potential benefits. We caution that while packaged PLM applications for the apparel sector are maturing, functional gaps still exist. Expectations for time to benefit need to take these factors into account.
- **Now is the time to commit to full-scale PLM.** Apparel companies need to move beyond PDM to add direct material sourcing, vendor management and collaboration, and creative processes, such as collaborative product design and line planning, to the PLM footprint. Managing product data well is an essential step in creating the platform for other more strategic business processes to rest. Ultimately, competitive differentiation for apparel companies cannot depend on how well data is managed. It depends on what the companies can do with the data, both internally and collaboratively with business partners.

Last year, AMR Research wrote about PLM technology coming of age, something that continues to be more a journey than a destination. The good news is that business owners have now joined the journey, taking on a challenge that, until now, was largely headed by IT departments. Only with the two working in alignment can apparel companies maximize the benefits made possible with PLM technology. Expectations are high, and many software vendors are stepping up to the plate to take a swing at them, though gaps still exist. But ready or not, the time-to-market imperative linked with the need for cost control will drive apparel retailers and manufacturers, along with their technology providers, to where they need to go.

Appendix A: Research methodology

AMR Research, in conjunction with *Apparel* magazine, recently conducted a survey of 56 companies involved in the designing, manufacturing, and selling of apparel and footwear merchandise. More than half (51%) of respondents were apparel manufacturers, and 42% were retailers that are vertically integrated with private-label merchandise, offer branded apparel merchandise, or some combination of the two. Companies of all sizes expressed their interest in PLM technology by participating in the study. 32% of survey respondents had annual sales of more than \$1B, 37% \$51M to \$1B, and 31% under \$50M.

Acronyms and Initialisms

Research and Advice That Matter

Founded in 1986, AMR Research provides subscription advisory services and peer networking opportunities to operations and IT executives in the consumer products, life sciences, manufacturing, and retail sectors. We are the No. 1 research firm focused on the intersection of business processes with value chain and enterprise technologies.

AMR Research has published more than 15,000 pieces of research. Grounded in industry and business process expertise, our analysts deliver independent, leading-edge research on established and emerging technologies. This analysis is supported by the best research data in the industry, expert-led Peer Forums, and daily interaction with our members, the most comprehensive community of practitioners in the industry.

More information is available at www.amrresearch.com. Your comments are welcome. Reprints are available. Send any comments or questions to:

AMR Research, Inc.
125 Summer Street
Boston, MA 02110
Tel: +1-617-542-6600
Fax: +1-617-542-5670

BOM	Bill of materials
CAD	Computer-aided design
COTS	Commercial off-the-shelf
DDSN	Demand-driven supply network
LOB	Line of business
NPDI	New product development and introduction
PDM	Product data management
PLM	Product lifecycle management
ROI	Return on investment



This is printed on 100% post-consumer recycled fiber. It is manufactured entirely with wind-generated electricity and in accordance with a Forest Stewardship Council (FSC) pilot program that certifies products made with high percentages of post-consumer reclaimed materials.