

The Product Lifecycle Management Market Sizing Report, 2007–2012

by Jeff Hojlo, Marianne D'Aquila, and Karen Carter

The PLM market grew at a healthy clip of 10% CAGR, even amidst global economic turmoil, thanks to emerging geographic and industry growth, increased need to better understand customer needs and manage portfolios of products, and global product development. We believe these trends will continue and that the market will expand at a 9% five-year CAGR, resulting in a \$20B market by 2012.

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The product lifecycle management market, now at \$12.7B, will grow to \$20B by 2012, with a 9% five-year CAGR, thanks to the increase in global product development, the need for unified data management, and rapid collaboration across the supply chain.

The
Bottom
Line

Executive Summary

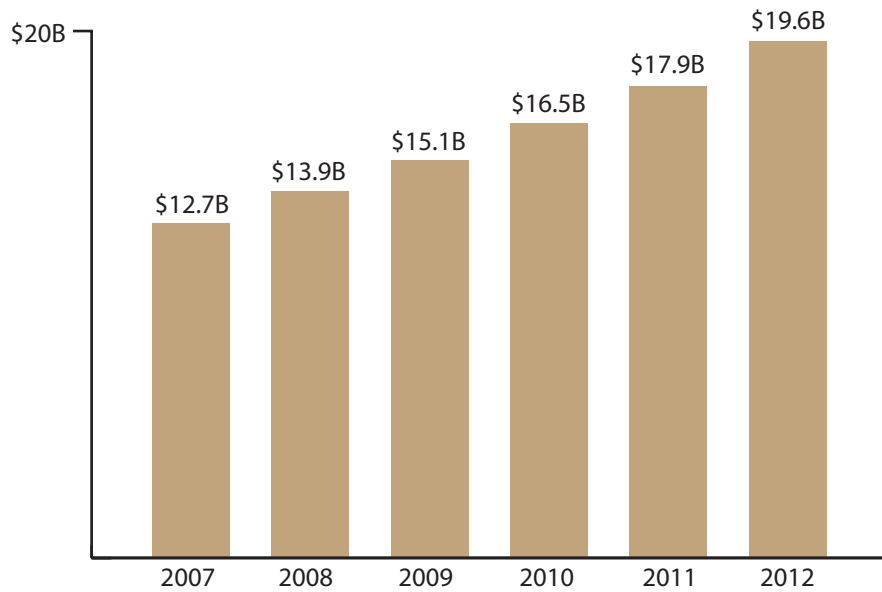
In 2007, the product lifecycle management (PLM) market continued the trends of consolidation among traditional vendors and maturation of PLM processes, i.e., customer needs management (CNM), product portfolio management (PPM), and direct materials sourcing. Hence, the ecosystem of PLM providers is expanding to include best of breeds that fill specific PLM niches, ERP, office tools, content management, and collaboration.

The market has also benefited from the increased need to manage multiple product seasons in industries like apparel, footwear, and softgoods as well as consumer packaged goods (CPG), where rapid collaboration with supply chain partners and fast time to market are imperative. The end result in 2007 was 10% market growth, and AMR Research believes the PLM market will continue its steady growth at a 9% CAGR through 2012.

The trend of consolidation among the big, traditional PLM players continues, with Siemens acquiring UGS and Oracle buying Agile. Meanwhile, vendors such as Autodesk and PTC continue to make smaller, strategic acquisitions to enhance existing modeling functionality. A common theme in these acquisitions is establishing a digital pipeline, or the links between ideation (where whiteboarding, design, and digital model creation happen), engineering, and manufacturing.

As global product development and open innovation continue to grow, the need for infrastructure and services increases. This was validated in “The Product Lifecycle Management Spending Report, 2007–2008,” which showed an increased percentage of PLM budget spent on infrastructure than in 2006. Similarly, this market sizing survey also showed an overall increase in revenue derived from middleware and hardware. Services revenue also increased, likely as a result of the data and application integration, business process mapping, and team alignment and training that must occur to achieve global product development excellence.

Figure 1: PLM application revenue estimate, 2007-2012



Source: AMR Research, 2008

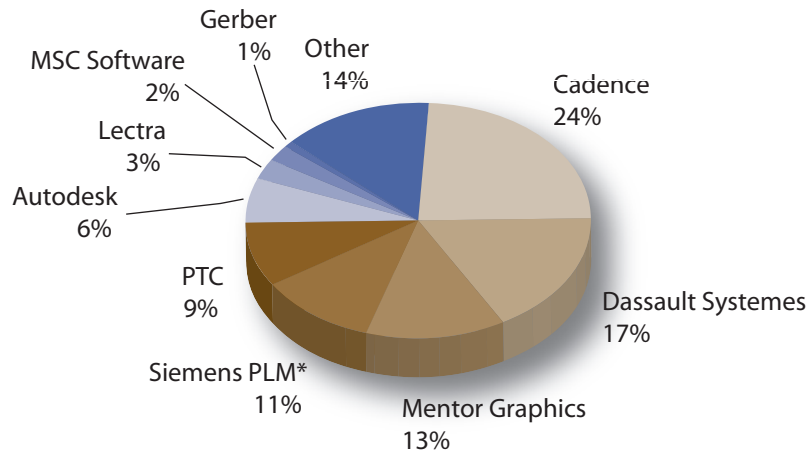
Acronyms and Initialisms

A&D	Aerospace and defense	PLM	Product lifecycle management
AEC	Architecture, engineering, and construction	PPM	Product portfolio management
BPM	Business process management	R&D	Research and development
BRIC	Brazil, Russia, India, and China	REACH	Registration, Evaluation, Authorization, and Restriction of Chemicals
CAD	Computer-aided design	RoHS	Restriction of Hazardous Substances Directive
CAGR	Compound annual growth rate	SaaS	Software as a service
CAPA	Corrective and preventive action	SCM	Supply chain management
CNM	Customer needs management	SKU	Stock-keeping unit
CPG	Consumer packaged goods	SMB	Small to midsize businesses
ERP	Enterprise resource planning	SOA	Service-oriented architecture
EUP	Ecodesign of Energy-using Products	WEEE	Waste Electrical and Electronic Equipment
NPDL	New product development and launch		

The 2007 Product Lifecycle Management Market

While 53% of total PLM revenue is from CAD, this will decline moderately through 2012 as PDM, collaborative design, portfolio management, and customer needs management increase their presence.

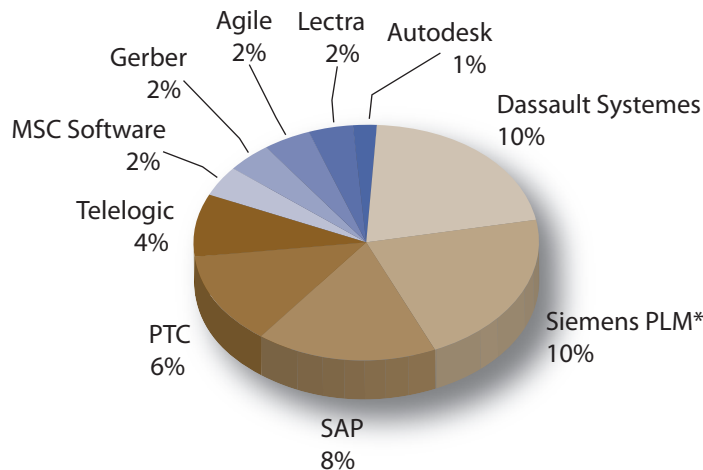
Figure 1a: CAD PLM market share leaders by 2007 total revenue share



*Siemens acquired UGS in May 2007 to form Siemens PLM.

Source: AMR Research, 2008

Figure 1b: Non-CAD PLM market share leaders by 2007 total revenue share



*Siemens acquired UGS in May 2007 to form Siemens PLM.

Source: AMR Research, 2008

PLM market growth

For the following reasons, the PLM market continues to grow at a 10% clip:

- Increased sales of 3D CAD and product data management (PDM)
- The need to better manage portfolios of products and customer needs
- Expansion of product lifecycle management in industries like apparel and footwear, CPG, and life sciences as well as in geographies like Asia-Pacific and Latin America

The definition of product lifecycle management also continues to expand to incorporate the entire new product development and launch (NPDL) process, with best-of-breed, ERP, and CAD-centric PLM vendors feverishly competing for the new opportunities.

Global product development and SMB drives PDM growth

As companies large and small involve more partners with product development, they realize the importance of one version of the truth versus having disparate pockets of knowledge. This is reflected in the growth of the PDM application segment, which expanded from 4% last year to 12% this year. We expect this trend to continue, thanks to the expansion of global product development into blossoming markets like Asia-Pacific, Latin America, and the BRIC countries as well as PLM adoption at small to midsize businesses (SMBs).

Understanding customer needs continues to be critical

Although not meeting the 27% growth we saw last year, customer needs management is still the fastest-growing segment of product lifecycle management at 21%. Although most of the interest lies in business-to-consumer industries like CPG, consumer electronics, and life sciences, interest is also great among apparel, automotive, and chemical companies that want to incorporate their customer needs into product development.

Despite this interest and adoption of CNM applications, the front end of innovation remains mostly disconnected from the rest of the PLM process. This is partly because vendors have been CAD focused, but it's mostly caused by the siloed nature of NPDL teams. As manufacturers realize they need to better manage the front end of innovation, they will begin asking for PLM applications that include integrated customer needs management.

The need for decision support and analytics creates opportunity for PPM

No single platform can manage all the necessary decisions throughout the product lifecycle from idea, to portfolio management, to design, to simulation, to direct materials sourcing, to manufacturing, to product end of life. This is why portfolio management vendor **Sopheon** continues to have success as well as SAP with its Resource and Portfolio Management and program management capabilities.

Still, analytics across the product lifecycle is a glaring gap that provides tremendous opportunity for all PLM, ERP, and business intelligence vendors. **IBM** and SAP, which acquired **Cognos** and **Business Objects**, respectively, have immediate opportunities to stitch together PLM analytics applications. IBM's strategy is not clear at this point, but SAP is actively working toward this with its product intelligence initiative.

Retail and apparel continue with growth

Apparel PLM software companies Gerber and Lectra continue to occupy the list of top revenue producers in the overall PLM market, with both seeing moderate growth in 2007. Product lifecycle management in apparel remains a hot inquiry topic, with recent data suggesting retailers continue to recognize the potential benefits product lifecycle management could bring to their businesses by shortening time to market cycles. Particular areas of interest from retail end users are integrating product design with direct materials sourcing, enhancing line planning (i.e., portfolio management) to incorporate merchandise assortment and demand signals, and integrating global calendars (i.e., project and program management).

Findings and analysis

Dassault took over the top revenue spot because of a change in the IBM channel relationship: IBM is still the primary channel for 1,000 named accounts, but Dassault took over management of its SMB efforts. Approximately \$300M in revenue from SMBs that were previously managed by IBM services is now generated directly by Dassault.

The other two of the big three, Siemens PLM and PTC, also achieved approximately 10% growth, with PTC staying close to its modeling roots. Siemens PLM growth can be attributed to the acceleration of deals after the acquisition by Siemens A&D and product announcements, which included NX5 and Teamcenter 8 as well as the new unified service-oriented architecture (SOA) platform, Teamcenter 2007.

PLM revenue for SAP increased at a healthy rate, as the company finally defined a product roadmap and also benefited from the fact that organizations are looking to use their enormous ERP investments for product lifecycle management.

Autodesk had a good year thanks to the increase in 3D CAD seats and overseas sales, especially in its architecture, engineering, and construction (AEC) business. The apparel and footwear opportunity for PLM continues to expand, with industry experts Gerber and Lectra taking advantage although they still lack complete PLM applications.

Finally, Oracle began to integrate Agile Software after closing the deal in October 2007 and has seen financial benefits from this, especially in CPG and life sciences where Agile had developed a strong presence.

From an application standpoint, customer needs management and product portfolio management continue to be the top two fastest-growing segments. Product data management made a bit of a comeback in 2007, as small to midsize businesses and emerging markets like Asia-Pacific and Latin America continued to grow. It also benefited from increased interest in product lifecycle management among retailers and CPG manufacturers.

The PLM market remains very fragmented. It not only includes three big CAD vendors, but also many that support the NPDL process. **Microsoft's** SharePoint, Project, and Excel remain prevalent in NPDL among users, particularly at small to midsize businesses. Our surveys consistently reveal that Microsoft tools are the most widely used to support the NPDL process. **EMC's** Documentum is often found in CPG and pharmaceuticals and has been integrated to formulation applications, including **Enginuity**. IBM has partnered with Dassault for the past 25 years and more recently with PTC, but IBM Software Group also brings applications like Lotus Notes and Websphere to support the NPDL process.

Currency conversion

AMR Research's methodology converts revenue from companies' reporting currencies to dollars using the average exchange rate over the four quarters. The exchange rate between the U.S. dollar and the euro went from 1.25 in 2006 to 1.37 in 2007. Therefore, some companies in Table 1, like SAP, show inflated growth because of the currency exchange. While detailed transactional analysis would be needed to do a more rigorous analysis, AMR Research has estimated the effect of currency conversion.

Looking specifically at the euro as an example, SAP year-over-year growth in euros would be 9% (13% as reported in constant currencies) and 19% with AMR Research's currency conversion. SAP and other European-based companies are adding an approximate uplift of 10% to their year-over-year growth and their contribution to the overall market.

Table 1: PLM vendors ranked by application revenue, 2006-2007

2007 Revenue Rank	Company	Revenue, 2006 (\$M)	Revenue, 2007 (\$M)	Revenue Share, 2006	Revenue Share, 2007	Growth Rate, 2006-2007
1	Dassault Systemes	1,482	1,725	13%	14%	16%
2	Cadence	1,484	1,620	13%	13%	9%
3	Siemens PLM*	1,207	1,327	10%	10%	10%
4	PTC	884	961	8%	8%	9%
5	Mentor Graphics	792	880	7%	7%	11%
6	SAP	411	491	4%	4%	19%
7	Autodesk	334	418	3%	3%	25%
8	Lectra	270	297	2%	2%	10%
9	Telelogic	213	258	2%	2%	21%
10	MSC Software	260	247	2%	2%	-5%
11	Gerber	183	196	2%	2%	7%
12	Oracle**	48	117	0%	1%	144%
Subtotal		7,568	8,537	66%	67%	13%
Other PLM Vendors		3,986	4,172	34%	33%	5%
Total		11,554	12,709	100%	100%	10%

Note: See the currency conversion sidebar for more on the revenue figures.

*Formerly UGS, which became part of Siemens in May 2007

**Oracle acquired Agile in July 2007

Source: AMR Research, 2008

Table 1a: PLM and CAD revenue from top vendors, 2007

2007 Revenue Rank	Company	Non-CAD PLM Revenue, 2007 (\$M)	CAD PLM Revenue, 2007 (\$M)	PLM Total Revenue 2007 (\$M)
1	Dassault Systemes	569	1,156	1,725
2	Cadence	0	1,620	1,620
3	Siemens PLM*	597	730	1,327
4	PTC	336	625	961
5	Mentor Graphics	0	880	880
6	SAP	491	0	491
7	Autodesk	42	376	418
8	Lectra	119	178	297
9	Telelogic	258	0	258
10	MSC Software	123	123	247
11	Gerber	118	78	196
12	Oracle**	111	6	117
Subtotal		2,764	5,771	8,535
Other PLM Vendors		3,218	956	4,174
Total		5,982	6,727	12,709

Note: See the currency conversion sidebar for more on the revenue figures.

*Formerly UGS, which became part of Siemens in May 2007

**Oracle acquired Agile in July 2007

Source: AMR Research, 2008

Table 2: PLM vendors ranked by license revenue, 2006-2007

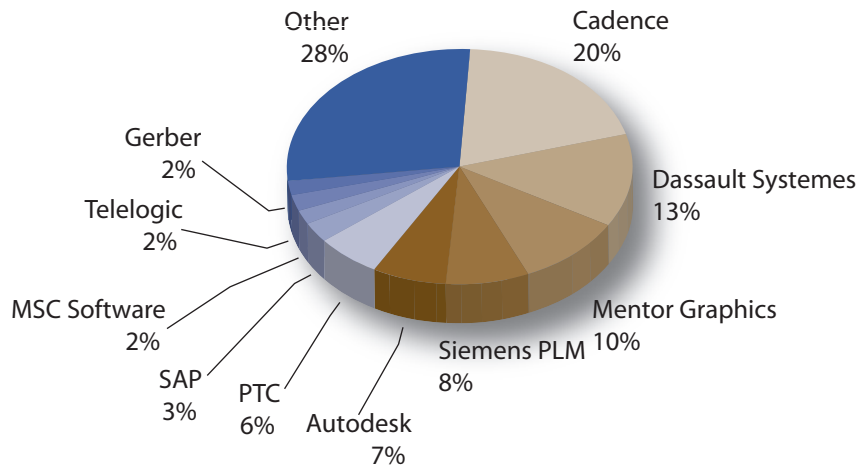
2007 Revenue Rank	Company	Revenue, 2006 (\$M)	Revenue, 2007 (\$M)	Revenue Share, 2006	Revenue Share, 2007	Growth Rate, 2006-2007
1	Cadence	982	1,037	21%	20%	6%
2	Dassault Systemes	593	690	13%	13%	16%
3	Mentor Graphics	461	512	10%	10%	11%
4	Siemens PLM*	375	413	8%	8%	10%
5	Autodesk	284	355	6%	7%	25%
6	PTC	272	296	6%	6%	9%
7	SAP	135	162	3%	3%	20%
8	MSC Software	111	95	2%	2%	-15%
9	Telelogic	94	113	2%	2%	20%
10	Gerber	110	114	2%	2%	4%
11	Lectra	78	86	2%	2%	10%
12	Oracle**	19	46	0%	1%	142%
Subtotal		3,513	3,919	74%	74%	12%
Other PLM Vendors		1,215	1,373	26%	26%	13%
Total		4,728	5,292	100%	100%	12%

*Formerly UGS, which became part of Siemens in May 2007

**Oracle acquired Agile in July 2007

Source: AMR Research, 2008

Figure 2: PLM vendor license revenue share, 2007



Source: AMR Research, 2008

PLM revenue segments and market channels, 2007

Software as a service (SaaS) and hosted models remain a very small portion of the PLM market, despite growing steadily at 10%. The primary reason for hesitation in adopting this model is fear of sharing product intellectual property online, although strong security capabilities have been developed within existing SaaS applications, like those from **Arena Solutions**. For the SaaS model to really take off, however, the products must evolve to support other PLM processes, such as direct materials sourcing, supplier relationship, and customer needs management. An example of the latter is **Brightidea.com**, which **Cisco** uses to power its iPrize contest for the next billion-dollar idea.

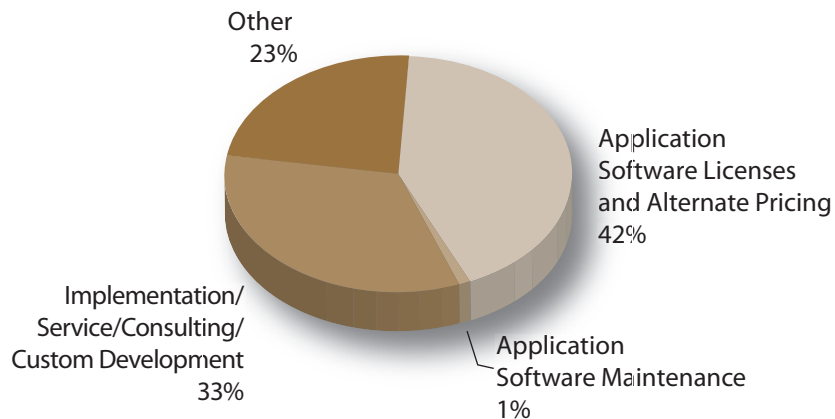
Revenue growth from maintenance stayed steady from last year, while license revenue declined and middleware and other infrastructure increased. This is consistent with the trend found in our PLM spending report, which showed increased PLM budget allocation to infrastructure: portals, data and application integration, storage, security, and business process management (BPM). Vendors overall also saw a slight uptick in services revenue.

Table 3: PLM application revenue share by revenue type, 2006-2007

Revenue Type	Revenue, 2006 (\$M)	Revenue, 2007 (\$M)	Revenue Share, 2006	Revenue Share, 2007	Growth Rate, 2006-2007
Application Software Licenses	4,716	5,292	41%	42%	12%
Alternate Pricing and Delivery (subscription, hosted, and SaaS)	139	153	1%	1%	10%
Application Software Maintenance	3,697	4,194	32%	33%	13%
Implementation/Service/Consulting/Custom Development	2,865	2,923	25%	23%	2%
Other	136	147	1%	1%	8%
Total	11,554	12,709	100%	100%	10%

Source: AMR Research, 2008

Figure 3: PLM application revenue share by revenue type, 2007



Source: AMR Research, 2008

PLM application segments, 2007

Customer needs management and product portfolio management remained the fastest-growing segments of product lifecycle management. Product data management increased its growth this year because of small and midsize business, emerging international, and global product development growth. Collaborative product design remains a growth segment (although growth slowed slightly compared to last year) because of the need for NPDL teams to quickly and efficiently share 3D models and communicate. Direct materials sourcing is also a growth segment, particularly in consumer-based, fast-moving industries.

- **Product data management**—This is the most mature segment of PLM, and we saw growth slow over the past two years. However, because of global product development, open innovation, emerging market demand in Asia-Pacific and Latin America, and expanding interest from small and midsize businesses, product data management grew a very healthy 13% last year. And the future looks bright, as the aforementioned trends will drive an estimated 13% CAGR.
- **Product portfolio management**—It's not just large numbers of products and projects that drive the need for product portfolio management; it's global competition and time to market. Manufacturers need to be able to perform cost benefit analysis on new product ideas, manage against market risks, and build and optimize a solid pipeline of products that companies can use to respond to market opportunity quickly. As such, the market continues to grow at a fast clip of 17%, the second fastest-growing segment. Among best of breeds, Sopheon has had the most traction in the PPM market. Agile (now part of Oracle) and SAP also have had success focusing on building out their portfolio management capabilities. Other vendors that provide applications in the PPM arena include **Artemis**, **Hard Dollar**, **Primavera**, **Planview**, **Centric Software**, **Computer Associates** (formerly Niku), Deltek (acquired Welcom), and Microsoft.
- **Collaborative product design**—The collaborative product design capability is mission critical for engineers, but what about nonengineers, like outside partners and customers, and new internal constituents, like sales, marketing, and field service? These groups need to be able to view 3D images to verify opportunity, determine capability to supply, build marketing materials, and understand repair instructions. Companies like **Right Hemisphere** and **Seemage** have made a business of extending CAD models to these other collaborators across the NPDL process. This segment of product lifecycle management maintained steady growth in 2007 at 13%. In addition to the PLM suite vendors, others to be aware of in this category include **Adobe**, Autodesk, Microsoft, and **Lattice Technologies**.

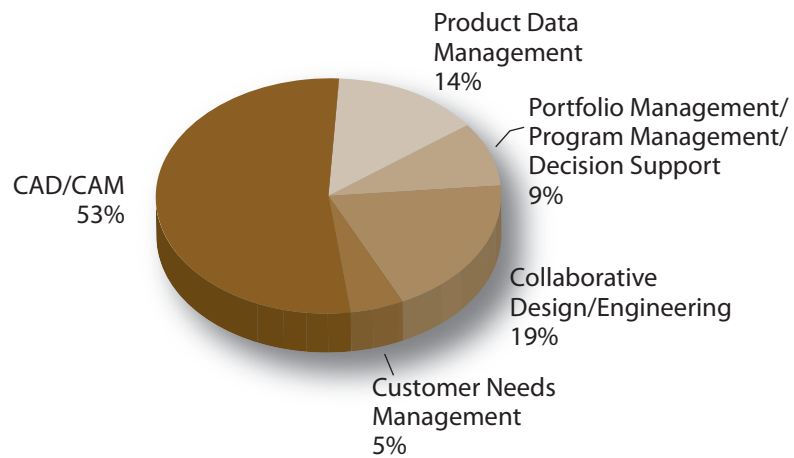
- **Customer needs management**—Customer needs management, as AMR Research defines it, is not just about ideation. Once the idea or product improvement is determined and the opportunity validated, manufacturers need to send products through a phase-gate process to model and develop the concept and requirements, evolve the product roadmap, and determine feasibility with design, engineering, and manufacturing. Quality management processes need to be integrated with customer needs management, as an open dialog needs to be established with customers so manufacturers can help address any product issues. Customer needs management is a critical business process for ensuring continual delivery of the right product to new and existing customers. And because of the critical nature of the front end of innovation, it grew at a 21% clip this year and will grow at a five-year CAGR of 17%.
- **Direct materials sourcing**—Many companies keep direct materials sourcing separate from the product innovation process when they should be tightly coupled. This is particularly true for markets where time to market is critical, like consumer electronics and apparel, and compliance-intensive markets, like high tech and process manufacturing. Based on end-user inquiry and our primary research, manufacturers need to connect sourcing with product development across industries and particularly in ones where there are multiple SKUs, complex products, and fast-changing market demand (for more information on growth in direct materials sourcing, see “The Procurement and Sourcing Applications Report, 2005–2010”).

Table 4: PLM license revenue and share by application segment, 2006-2007

Application Segment	Revenue, 2006 (\$M)	Revenue, 2007 (\$M)	Revenue Share, 2006	Revenue Share, 2007	Growth Rate, 2006-2007
Product Data Management	656	745	14%	14%	13%
Portfolio Mgmt. / Program Mgmt. / Decision Support	388	455	8%	9%	17%
Collaborative Design/Engineering	903	1,016	19%	19%	13%
Customer Needs Management	227	275	5%	5%	21%
CAD/CAM	2,554	2,801	54%	53%	10%
Total	4,728	5,292	100%	100%	12%

Source: AMR Research, 2008

Figure 4: PLM license revenue share by application segment, 2007



Source: AMR Research, 2008

PLM revenue and market share by company size, geography, and industry, 2007

In 2007, PLM revenue grew at a faster clip at small and midsize businesses (under \$250M) than at large companies (\$1B or more), which are historically the PLM stalwarts. Dassault's success over the past two years with its SMB SMARTEAM (1,700 new customers) application and Siemens PLM's success with its SMB product line Velocity (20+% growth) show this.

One of the reasons for this success may be the way the companies package their applications: SMARTEAM is now included in the CATIA PLM Express package, and Teamcenter Express includes the design tool SolidEdge. Autodesk, long targeting the small engineering workgroup, recognized a 30% increase in revenue. If you look at its product set, the recipe for success is similar to the aforementioned two applications: data management (Vault) and design (AutoCAD for 2D and Inventor for 3D).

A simplified packaged application for design and data management is attractive to small to midsize businesses. Outside these applications, other options include Oracle's Agile Advantage and Microsoft, which has been a default application for years. Although Microsoft's tools are used at companies of all sizes to help with the communication and collaboration that must take place during new product development and launch, some small and midsize businesses with tiny development teams and simple product lines may only require SharePoint, Excel, and Outlook to do the job.

Geographically, product lifecycle management continues to grow fastest in Latin America and Asia-Pacific because of infrastructure and economic growth. This results in more businesses being created that produce goods and services. These businesses and their goods require design, data management, and collaboration platforms.

U.S. growth slowed and European growth grew, a trend consistently reflected in many software companies, not just product lifecycle management.

By industry

Traditional industries like automotive, A&D, industrial equipment, and high tech were early adopters of CAD and product data management, but have only recently begun to look to PLM applications to support other NPDL processes, like managing portfolios of products, customer needs, and direct materials sourcing. They are also looking to link their manufacturing process planning and execution processes with the rest of the product lifecycle. For example, **Volkswagen**, a long-time user of manufacturing software from **Tecnomatix**, began work on integration to product development last Fall through Siemens PLM's Teamcenter.

Apparel, footwear, and softgoods is one of the fastest-growing markets for the following reasons:

- Requirements retailers have to quickly bring new products to market at multiple points during the year (fast fashion).
- They must manage thousands of SKUs during line planning and product development.
- They must use a wide network of suppliers and development partners to meet time-to-market and product quality goals.

Product lifecycle management is designed for these complexities. Because of this, PLM companies with apparel offerings, such as Dassault ENOVIA MatrixOne, Siemens PLM, Gerber, **Freeborders** (now part of Lawson), Infor, and Lectra, have a tremendous opportunity in front of them.

There is growing interest in product lifecycle management for software development, as product managers and software engineers look to streamline and automate the manual processes of fielding customer product requests, reviewing market requirements documents, writing code, and collaborating. Industries such as automotive, A&D, and consumer electronics all incorporate software in their products to be competitive, with vendors such as **Accept**, IBM Rational (now including Telelogic), **Ryma**, and **Sofia** excelling in this area.

Process industries, such as food and beverage, health and beauty, and life sciences, continue to be a challenging sell for formulation vendors because of the resistance from R&D to using systems to manage an inherently creative process. Discrete-focused PLM vendors like Dassault, Siemens PLM, and PTC don't provide formulation applications and instead integrate with whatever tool is in place. However, they do target CPG and life sciences companies with their data management products. For example, Siemens PLM developed the Research Knowledge Management application with **Procter & Gamble**, and the application acts as a single source for all laboratory and spec information.

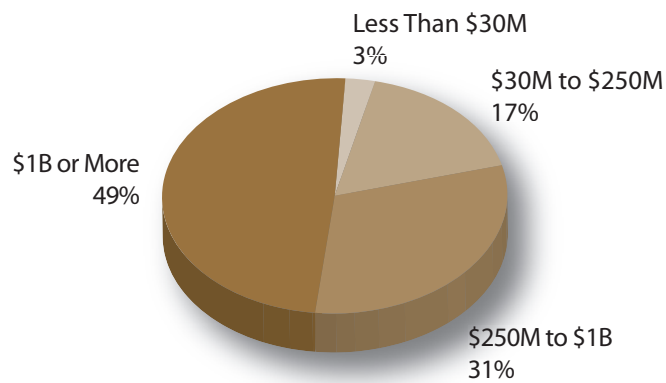
The one exception to this may be Siemens PLM. The company is working to integrate its Interspec specification management product with Teamcenter and NX5 for a more complete application for the process industry, with formulation management, data management, and packaging design capabilities available. While the vendors with a discrete heritage sort out their process industry strategies, several vendors are filling the gap: **OSISoft**, Enginuity, **Lascom**, and **Selerant**. Digital assets for packaging graphics and labels present some unique challenges addressed by vendors including **Design2Launch**, **Paxonix**, and **Schawk**.

Table 5: PLM license revenue and share by customer company size, 2006-2007

Customer Revenue	Revenue, 2006 (\$M)	Revenue, 2007 (\$M)	Revenue Share, 2006	Revenue Share, 2007	Growth Rate, 2006-2007
Less than \$30M	137	153	3%	3%	12%
\$30M to \$250M	780	900	18%	17%	15%
\$250M to \$1B	1,466	1,641	32%	31%	12%
\$1B or More	2,345	2,598	47%	49%	11%
Total	4,728	5,292	100%	100%	12%

Source: AMR Research, 2008

Figure 5: PLM license revenue share by customer company size, 2007



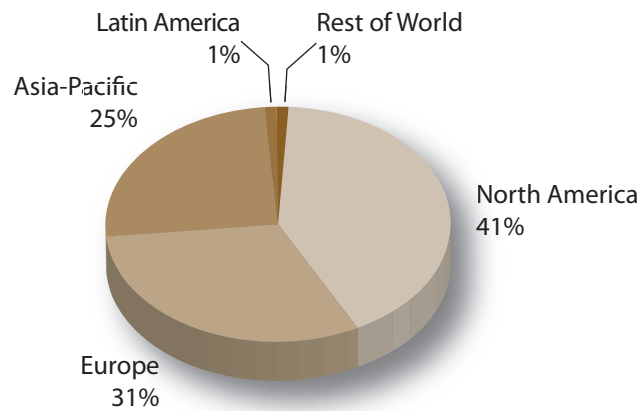
Source: AMR Research, 2008

Table 6: PLM license revenue and share by geographic region, 2006-2007

Region	Revenue, 2006 (\$M)	Revenue, 2007 (\$M)	Revenue Share, 2006	Revenue Share, 2007	Growth Rate, 2006-2007
North America	2,071	2,160	44%	41%	4%
Europe	1,504	1,641	32%	31%	9%
Asia-Pacific	1,040	1,344	22%	25%	29%
Latin America	47	74	1%	1%	58%
Rest of World	66	73	1%	1%	12%
Total	4,728	5,292	100%	100%	12%

Source: AMR Research, 2008

Figure 6: PLM license revenue share by geographic region, 2007



Source: AMR Research, 2008

2007 Product Lifecycle Management Market Structure

The blockbuster deals over the past year were Siemens' Automation and Drives division acquiring UGS for \$3.5B and Oracle buying Agile for \$495M. Both transactions highlighted two segments that continue to converge on the PLM market: manufacturing and ERP. Similarly, Dassault Systemes is partnering with production management vendor **Rockwell Automation**, and midmarket ERP company **Lawson** acquired the apparel and footwear PLM product line of Freeborders. These acquisitions reflect what users tell us they want from their PLM systems: to use enterprise investments like ERP, CRM, and supply chain management (SCM) and connect product design to manufacturing process design to ensure product capability, capacity, and quality.

Others acquisitions of note include Autodesk acquiring simulation companies **Moldflow**, **Opticore**, and **Plassotech**; PTC acquiring 3D history-free modeling company **CoCreate**; and Dassault acquiring 3D product documentation and collaboration vendor **Seemage**.

The following top 12 vendors account for the bulk of the PLM market revenue. The market then quickly fragments into specialty vendors focused on a portion of the PLM footprint or by industry requirements. What follows is a look at these leading vendors by revenue.

Autodesk

With 25% growth, Autodesk had a healthy 2007, thanks to an increase in 3D licenses (and not at the expense of its 2D AutoCAD base) and steady international growth, particularly in Asia-Pacific. The company continues to focus on its AEC business with its Revit product line and building information modeling approach, which is basically product data management for the AEC industry.

From a manufacturing standpoint, Autodesk made a number of small acquisitions of simulation companies over the past year, including Moldflow (injection modeling), Opticore (digital prototyping in the auto industry), and Plassotech (analysis and simulation for mechanical design). These acquisitions are an effort to build out a modeling toolkit for the designer and establish what it calls the digital pipeline. Because of a slow start this year, the company's growth rate will likely lessen, although still be quite healthy compared to its PLM brethren.

Cadence

Cadence's focus on the designing of printed circuit boards continues to promote steady revenue growth of 9% for the company. This growth, and in particular license growth, is slightly down from last year. As the company does not offer non-CAD PLM applications, its business is closely affected by the buying trends of the electronic design automation (EDA) market. But we believe this slight decline is not a trend. Overall, we expect continued strong growth in electronic design automation. Cadence is one of the most prevalent brands in the EDA market and, thus, the top revenue producing company. We expect this to continue.

Dassault Systemes

Dassault takes over the top revenue spot this year, largely because of a change in its longstanding relationship with IBM: IBM retains control of 1,000 named accounts and Dassault takes over management of the remaining channel of existing accounts and opportunities, reducing reliance on IBM as the principal sales channel in the United States. The result of this is about \$300M in directly generated revenue, which we previously did not recognize as part of Dassault's growth.

Aside from the IBM change, the company saw a decline in overall license sales, but was helped by a strong year with its SMARTEAM SMB product (1,700 new customers). Dassault's v6 SOA announcement, which included the lightweight, online collaboration platform 3DLive announced last year, should help accelerate sales in 2008. The company also focused on expanding its presence in emerging markets like apparel and footwear and CPG, which have been growth areas for product lifecycle management. Overall, Dassault grew 16% in 2007.

Gerber

Gerber Technology, a division of Gerber Scientific Instrument, has established a strong presence in the apparel and footwear market with its PDM system, WebPDM. It has enhanced its offering in recent years with its Fashion Lifecycle Management suite, including workflow for process approvals, document publishing, bill of materials management, and costing, and a partnership with sourcing vendor **ecVision**.

Much like Lectra, the company has a long history in the apparel market and derives a portion of its revenue from pattern making and cutting equipment for apparel as well as industries like automotive, furniture, and industrial fabrics. Gerber achieved moderate growth last year of 7% and must continue to evolve its PLM application in order to compete long term with PLM vendors that are rapidly expanding capabilities and apparel industry expertise.

Lectra

The differentiator with this company continues to be its deep apparel industry domain expertise. As with any vertical market, companies are attracted to vendors that have this industry knowledge. Lectra continues to see success against the large PLM providers, at 10% growth in 2007 thanks to 30% of its revenue from garment cutting equipment, 40% from professional services (systems integration and consulting), and a growing software business.

Horizontal PLM players continue to build out their apparel knowledge and teams, but still can't compete with a company that has a 30-year-plus heritage in the industry and the knowledge of the business processes retailers require. On the latter point, Lectra has instituted pre-sales business process assessments to help retailers that need to establish their NPDL processes and teams, and the assessments have become an excellent vehicle for Lectra to showcase its expertise. But the company recognizes it must evolve its product development line beyond data management, line planning, and design to win PLM business from manufacturers and vertical retailers that need to connect their NPDL process to the supply chain. To do this, the company is improving its workflow capabilities, adding a management dashboard, and connecting its Kaledo design application into these capabilities.

Mentor Graphics

As one of the largest providers of EDA software, like Cadence, Mentor Graphics enjoyed solid growth in 2007 (11%), in line with 2006 growth of 12%. We expect this company to continue on a similar trajectory in line with the healthy demand for EDA software. The company is focused on design and has increased capabilities in non-CAD PLM processes and managing systems.

MSC Software

MSC Software's revenue shrank for the second straight year, although the decline lessened from 12% in 2006, to 4% in 2007. The decline continues to be the result of competition from large PLM vendors like Siemens PLM and Dassault that have their simulation tools built into their PLM product suites. Global manufacturers may find this integrated approach more attractive than purchasing simulation seats for the engineering workgroup. The company's flattening decline in revenue over the past year is attributed to its recognition of this fact. It launched SimEnterprise R2, which includes an enterprise simulation portal enabling capturing, management, and reuse of simulation content across organizations.

Despite the competitive challenges the company faces, MSC is widely recognized as having leading technology for engineering simulation. PLM companies Dassault, PTC, and Siemens PLM as well as leading engineering services firms like **Satyam** resell MSC's products, and manufacturers **Airbus** and **Boeing** use the software. We believe this agnostic simulation provider approach will enable future growth for MSC.

Oracle

Agile became part of Oracle in October 2007. Although the company showed sluggish growth (3%) last year, there are signs that it's beginning to drive revenue for Oracle. Agile is a core component of Oracle's broader strategy to integrate its enterprise pieces: CRM, human capital management, ERP, business intelligence, and product lifecycle management.

Agile started building out its practices and expertise in emerging PLM markets, such as CPG and life sciences, years ago, well before the company's primary PLM competition focused on these segments. This appears to be paying dividends now that Agile has strong financial backing, with many of the early post-acquisition deals coming from these markets. One core reason for this success may be the **Prodika** acquisition in June 2006. Through the acquisition, Agile acquired Prodika's global specification management and formulation application for process industries.

Additionally, Agile was early to the game in application areas that now have considerable traction: quality management (Product Quality Management), environmental compliance (Product Governance and Compliance), product portfolio management, and sourcing (Product Cost Management). Given these trends and capabilities, in addition to Oracle having some existing PLM revenue, we expect considerable growth in 2008.

PTC

PTC's focus on building out a toolkit for the engineer paid dividends, leading to 9% growth in 2007. It acquired **CoCreate** in November 2007 to add history-free design capability to its stable of engineering tools: Isodraw (technical drawings), MathCAD (complex calculations), and Arbortext (technical publishing). The history-free, or explicit, modeling capability is attractive to manufacturers that work with complex 3D models and need to communicate these models to disparate teams that have never worked on the design, don't need to know the history, and just need to focus on the segment of the product they are designing. Although the CoCreate acquisition will not alone drive growth, we believe PTC's recent product releases of Windchill 9 (which includes MPMLink and enhanced functionality in PDMLink) along with a strong international presence will help the company maintain the current growth rate and drive revenue well past the \$1B mark by the end of 2008.

SAP

SAP's growth increased in 2007, albeit off a small PLM revenue base and in part because of currency conversion from euros to the (weak) dollar. The trend of manufacturers looking to use their existing enterprise investments for PLM is irrefutable, according to our research. With the ubiquitous presence of SAP, manufacturers will typically include SAP on the short list of PLM options, competing with the likes of Siemens PLM, Dassault, and PTC for business. Often, what ends up happening is co-existence of one (or more if a large company) of the PLM vendors with SAP for program management, bill of materials, and viewable files storage across the enterprise from engineering, to manufacturing, to program management.

For the first time, it also published a product roadmap for the next three years and began to deliver on this with the release of its RPM (Resource and Portfolio Management) 4.5, including tight integration with its cProjects (project management) offering. One key addition to SAP's partner program this year was product documentation and collaboration company Right Hemisphere, which enables lightweight 3D CAD models to be communicated easily across the enterprise. All of this collectively led to 19% growth in 2007, which translates to 9% EUR growth and 13% in constant currencies.

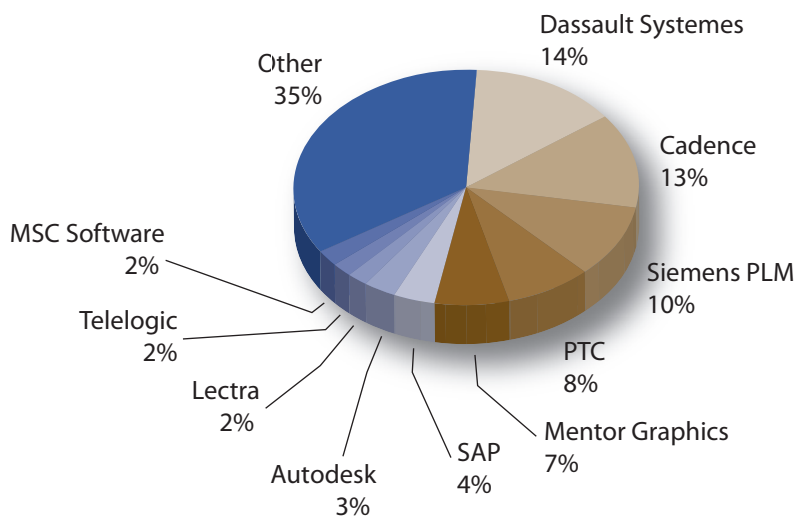
Siemens PLM

After experiencing a decline in revenue in 2006, the Siemens A&D (Automation & Drives) division acquired UGS in early 2007 and made significant product improvements in the CAD (NX) and manufacturing process management (Tecnomatix) product lines. Then in September, Siemens released Teamcenter 2007, the first time its entire solution has been available on a single data model and single server in an SOA. These product improvements, combined with continued growth in the SMB product line (Velocity), a strong management team, and financial stability, resulted in a strong 2007 for Siemens.

Telelogic (an IBM company)

Telelogic continued to experience strong overall growth of 21% (including 20% license) as the need to manage electromechanical and software requirements grows in markets like A&D, automotive, and consumer electronics. Software in particular is a great opportunity as products become smarter in order to enhance the user experience (e.g., vehicle stability systems and GPS systems like OnStar) and meeting safety requirements becomes a design prerequisite. The 2007 acquisition by IBM was recently finalized, and Telelogic is now part of the Rational software development product line. This company has the opportunity to take advantage of its Focalpoint product as its front-end requirements validation platform and integrate with IBM's PLM and information integration product line. Even without this integration, we expect continued growth for this organization, which includes the industry's leading requirements management product in DOORS.

Figure 7: Top 10 PLM vendors by 2007 total revenue share



Source: AMR Research, 2008

— Product Lifecycle Management Market Forecast, 2007–2012

The application areas of product data management, product portfolio management, and customer needs management as well as product lifecycle management will continue to expand into fast moving industries and emerging markets, consistent with the current trend. There are, however, other areas that support the NPDL process, such as analytics, decision support, and quality management, that are still immature segments of existing PLM solutions. As the applications around these segments mature, the market potential for PLM will expand as well.

Growth drivers

The need to more effectively innovate is always at the top of executive's lists. This is apparent through conversations we have with our clients and our annual application surveys, where respondents indicate that PLM is becoming increasingly more strategic to IT and business executives. This doesn't always translate into PLM sales because many have equated PLM with CAD and haven't looked to PLM as a platform that can help them manage the entire NPDL process. This is changing, however, as PLM vendors evolve their products to help manage the business decisions that need to be made at an idea, portfolio, and market level.

At the same time, interest in PLM from emerging geographic markets and industries as well as small to midsize businesses has resulted in a spike in PDM sales. The future looks bright for this segment, after a lull in the past year. 3D is beginning to drive CAD sales at the engineering workgroup level. Interestingly, using Autodesk as a barometer, this is not at the expense of 2D seats; engineers see value in maintaining 2D drawings. We have not seen widespread interest in purchase of 3D seats by non-engineers, probably because of the evolution of 3D collaboration formats like JT, PDF, and 3DXML as well as products like Adobe Livecycle, Dassault's Seemage, and Right Hemisphere. Collectively, these trends make us optimistic about the future growth potential of the PLM market.

PLM functionality deepens to fill existing gaps

While product lifecycle management has matured in the past several years, there's still plenty of opportunity for improvement, hence the predicted growth. Here are some of the areas seeing development because of business process demands:

- **Analytics**—The gap in analytics for validating new products will continue to close. Expect better ability to validate market requirements and evaluate the cost-benefits of new features. Applications to evaluate manufacturing, supply, and service effects of designs will help ensure products are sustainable after launch.

- **Using ideas from customers and partners**—External partner collaboration has always been a major factor in PLM investment. However, as these external relationships become more intimate, applications are morphing to support the security and flexibility needed. Digital rights management and lightweight 3D visualization are some of the improvements underway. CNM applications help to manage and validate these ideas as they are incorporated to the front end of innovation.
- **Decision support**—Manufacturers must be able to quickly make decisions across the product lifecycle—from idea inception, to product and manufacturing process design and validation, to aftermarket service and support, to end of life. Portfolio management products are for many the default decision support platform, but they need to continue to evolve to support the entire decision lifecycle.
- **Compliance**—The influence of regulations like ROHS and WEEE in high tech, REACH in chemicals, 21 CFR part 11, and EuP will grow as European Union states put more strict reporting requirements in place and the directives are established in other markets, like China, South Korea, Australia, and the United States (starting with California). PLM plays a critical role in enabling compliance, in design, data management, supplier relationship management, and reporting.
- **Quality management**—Although we don't track quality management as a segment of PLM, it is a critical process that needs to be tied to product development to ensure quality product design and efficacy. In fact, our PLM spending research revealed quality management as the most strategic PLM investment for 2008–2010. This includes pre-production and after the product is launched. This latter point brings up the need to tie the service lifecycle to the product lifecycle. Corrective and preventative action (CAPA) products like Oracle's (part of the Agile suite) are one step ahead in enabling companies to correct any product issues and improve long-term quality. We expect PLM vendors to enhance their capabilities in this area, either through organic development or, more likely in the short term, partnership with one of the many small quality management vendors.
- **Supplier management**—Open innovation is not possible without a strong direct materials sourcing application. Across industries, manufacturers need to effectively collaborate with and source materials from their network of suppliers to meet time-to-market goals. In fast-moving goods industries this integration is particularly vital because of multiple seasons and shorter product lifecycles. PLM vendors are actively moving to develop these capabilities, both organically and through partnerships.

Growth inhibitors

While the market looks promising for PLM investment, there are factors that could stall its growth:

- **Disparate product development groups**—The different groups that support different phases of the NPDL process don't communicate. Marketing and sales come up with new product ideas, but don't validate concepts with product management and engineering, who then don't work with manufacturing to develop the optimal manufacturing processes. One reason for this is the cultural divide that exists among these groups (read: services opportunity), and another is the lack of robust infrastructure to enable unified global data management and communication (read: SOA opportunity).
- **Supplier relationship management and quality**—The development team of the Boeing 787 Dreamliner has collaborated with its expansive supplier network, but has suffered product quality issues and product launch delays as a result. This raises the need for not just open innovation, but also concurrent strong supplier relationship management and quality processes. PLM applications must either provide these capabilities organically or easily support these processes with tight partnerships.
- **Sales and operations planning (S&OP)**—Our recent data has shown that two of the top reasons product launches fail are higher than projected costs and ineffective product pricing. The S&OP process can no longer exist in a silo; it must be connected with product planning and design.
- **Disruptive Internet technologies**—Online communities, blogs, global messaging services (e.g., Twitter), and even virtual worlds (e.g., Second Life) are fast becoming tools that designers, engineers, and marketers use to understand customer needs, vet new product ideas, and communicate with colleagues about best practices. PLM vendors need to have a strategy for federating the knowledge created in these environments into the product lifecycle.
- **Lack of a strong network of global services**—With the integrations that must be in place for product lifecycle management to be effective, manufacturers need help establishing the requisite business processes and teams. PLM vendors must continue to nurture their network of service providers for systems integration, engineering services, industry expertise, change management, and organizational development.

- **Poor intellectual property protection and digital rights management**—The increase in counterfeiting, especially in emerging economies, is a real challenge for global manufacturers to manage. As companies open up their borders to outside partners to develop products, they also expose themselves to theft of intellectual property. This drives the critical need for information access control—ensuring the right people have access to the right information. In fact, according to our research, security is one of the top strategic investments (No. 1 in Europe) manufacturers feel they need to make to support their NPDL process. Vendors with authorization and authentication applications like CA and EMC, as well as those that provide digital rights management applications like Adobe, have a tremendous opportunity here.

Analysis

Our outlook for the PLM market remains optimistic, with a projected 9% CAGR through 2012. The primary driver of this projection is the continued need manufacturers have to manage product development across the globe, continued product complexity, and new industry and geographic market growth. And as more companies recognize the need to unify NPDL team members—engineers, product management, marketing, and supply chain—inside and outside the company, they will look to PLM to provide easy collaboration and centralized data management. They will also look to non-CAD collaboration tools like Adobe, Microsoft, and ERP vendors to help with this.

- Product data management provides the accurate system of record, and therefore remains the foundation for any PLM strategy. We expect product data management to occupy a large share of the market while growing at an increased rate of 12% CAGR as global product development and growing opportunity in emerging markets drives the need to manage product data.
- Collaborative design and engineering supports manufacturers' acceleration into using distributed design teams and open innovation with distributed designers, suppliers, customers, and academia. Global product development, as well as the incorporation of non-engineers into the product development process, will result in a healthy CAGR of 9%.
- Product portfolio management provides management visibility into the product development pipeline, while helping program managers and their cross-functional teams execute the NPDL process. The need for dashboard visibility and analytics to prioritize R&D investments based on market need and potential will drive a 17% CAGR for these applications.
- Customer needs management remains the least mature application category in PLM, resulting in a low market share percentage. However, manufacturers want to understand their customer's needs; evolving their product lines will drive significant 17% CAGR in this area.

- CAD is the most mature application category, and occupies the greatest market share for PLM. We anticipate a steady 6% CAGR as manufacturers switch from 2D to 3D, invest in simulation for faster and higher quality designs, and extend the use of 3D throughout their organizations.

There are a number of industries, such as apparel and footwear and CPG, that are technically late adopters of product lifecycle management when compared with A&D and automotive, but are rapidly becoming mature in their approach to product lifecycle management. After adopting PDM systems to manage multiple SKUs across disparate product development teams, they are quickly moving to integrate their design and product data platforms with the global supply chain, incorporating procurement and supplier information.

In our 2007 PLM spending study, process manufacturing industries like food and beverage and life sciences indicated significant spending on PLM in the next 12 to 24 months. Still, formulation-focused PLM companies struggle to sell to R&D, primarily because this audience is content with their current design methodology (in many cases enabled by Excel and e-mail) and worried that a PLM system will stunt creativity. As they, along with their marketing and supply chain colleagues, realize that PLM enables better data management and easier collaboration resulting in quality, compliant products, these fears will subside.

Small to midsize businesses are a fast-growing segment for PLM, as these manufacturers under \$250M in revenue realize that though their product development teams are not large, they still need systems to manage design data, product portfolios, and open innovation with suppliers and partners.

Table 7: PLM application revenue estimate by revenue type, 2007-2012

Revenue Type	Revenue, 2007 (\$M)	Revenue, 2008 (\$M)	Revenue, 2009 (\$M)	Revenue, 2010 (\$M)	Revenue, 2011 (\$M)	Revenue, 2012 (\$M)	Five-Year CAGR
Application Software License	5,292	5,732	6,209	6,725	7,284	7,892	8%
Alternate Pricing	153	180	211	247	287	332	17%
Application Software Maintenance	4,194	4,585	5,013	5,481	5,992	6,551	9%
Implementation, etc.	2,923	3,193	3,488	3,810	4,162	4,546	9%
Other	147	162	178	196	215	233	10%
Total	12,709	13,853	15,100	16,459	17,940	19,555	9%

Source: AMR Research, 2008

Table 8: PLM application revenue share by revenue type, 2007-2012

Revenue Type	Revenue Share, 2007	Revenue Share, 2008	Revenue Share, 2009	Revenue Share, 2010	Revenue Share, 2011	Revenue Share, 2012
Application Software License	42%	41%	41%	41%	41%	40%
Alternate Pricing	1%	1%	1%	2%	2%	2%
Application Software Maintenance	33%	33%	33%	33%	33%	34%
Implementation, etc.	23%	23%	23%	23%	23%	23%
Other	1%	1%	1%	1%	1%	1%
Total	100%	100%	100%	100%	100%	100%

Source: AMR Research, 2008

Table 9: PLM application revenue growth rates by revenue type, 2007-2012

Revenue Type	Growth Rate, 2007	Growth Rate, 2008	Growth Rate, 2009	Growth Rate, 2010	Growth Rate, 2011	Growth Rate, 2012	Five-Year CAGR
Application Software License	12%	8%	8%	8%	8%	8%	8%
Alternate Pricing	10%	18%	17%	17%	16%	16%	17%
Application Software Maintenance	13%	9%	9%	9%	9%	9%	9%
Implementation, etc.	2%	9%	9%	9%	9%	9%	9%
Other	8%	10%	10%	10%	10%	8%	10%
Total	10%	9%	9%	9%	9%	9%	9%

Source: AMR Research, 2008

Table 10: PLM and CAD application revenue estimate by application segment, 2007-2012

Application Segment	Revenue, 2007 (\$M)	Revenue, 2008 (\$M)	Revenue, 2009 (\$M)	Revenue, 2010 (\$M)	Revenue, 2011 (\$M)	Revenue, 2012 (\$M)	Five-Year CAGR
Product Data Management	1,788	2,009	2,250	2,518	2,817	3,109	12%
Portfolio Mgmt. / Program Mgmt. / Decision Support	1,093	1,219	1,434	1,728	2,063	2,347	17%
Customer Needs Management	661	762	906	1,070	1,256	1,447	17%
Collaborative Design/ Engineering	2,440	2,632	2,899	3,177	3,480	3,794	9%
CAD/CAM	6,727	7,231	7,610	7,966	8,324	8,858	6%
Total	12,709	13,853	15,100	16,459	17,940	19,555	9%
Total Non-CAD PLM	5,982	6,622	7,489	8,493	9,616	10,696	12%

Source: AMR Research, 2008

Table 11: PLM and CAD application revenue share by application segment, 2007-2012

Application Segment	Revenue Share, 2007	Revenue Share, 2008	Revenue Share, 2009	Revenue Share, 2010	Revenue Share, 2011	Revenue Share, 2012
Product Data Management	14.1%	15%	15%	15%	16%	16%
Portfolio Mgmt. / Program Mgmt. / Decision Support	8.6%	9%	10%	11%	12%	12%
Customer Needs Management	5.2%	6%	6%	7%	7%	7%
Collaborative Design/ Engineering	19.2%	19%	19%	19%	19%	19%
CAD/CAM	52.9%	52%	50%	48%	46%	45%
Total	100%	100%	100%	100%	100%	100%
Total Non-CAD PLM	47%	48%	50%	52%	54%	55%

Source: AMR Research, 2008

Table 12: PLM and CAD application revenue growth rates by application segment, 2007-2012

Application Segment	Growth Rate, 2007	Growth Rate, 2008	Growth Rate, 2009	Growth Rate, 2010	Growth Rate, 2011	Growth Rate, 2012	Five-Year CAGR
Product Data Management	12%	12%	12%	12%	12%	10%	12%
Portfolio Mgmt. / Program Mgmt. / Decision Support	15%	12%	18%	20%	19%	14%	17%
Customer Needs Management	19%	15%	19%	18%	17%	15%	17%
Collaborative Design/ Engineering	11%	8%	10%	10%	10%	9%	9%
CAD/CAM	8%	7%	5%	5%	4%	6%	6%
Total	10%	9%	9%	9%	9%	9%	9%
Total Non-CAD PLM	13%	11%	13%	13%	13%	11%	12%

Source: AMR Research, 2008

Table 13: PLM and CAD application revenue estimate by geographic region, 2007–2012

Region	Revenue 2007 (\$M)	Revenue 2008 (\$M)	Revenue 2009 (\$M)	Revenue 2010 (\$M)	Revenue 2011 (\$M)	Revenue 2012 (\$M)	Five-Year CAGR
North America	5,187	5,340	5,753	6,188	6,656	7,235	7%
Europe	3,940	4,156	4,379	4,608	4,844	5,026	5%
Asia-Pacific	3,228	3,879	4,379	4,938	5,561	6,257	14%
Latin America	178	277	362	461	574	684	31%
Rest of World	176	201	226	263	305	352	15%
Total	12,709	13,853	15,100	16,459	17,940	19,555	9%

Source: AMR Research, 2008

Table 14: PLM and CAD application revenue share by geographic region, 2007–2012

Region	Revenue Share, 2007	Revenue Share, 2008	Revenue Share, 2009	Revenue Share, 2010	Revenue Share, 2011	Revenue Share, 2012
North America	41%	39%	38%	38%	37%	37%
Europe	31%	30%	29%	28%	27%	26%
Asia-Pacific	25%	28%	29%	30%	31%	32%
Latin America	1%	2%	2%	3%	3%	4%
Rest of World	1%	1%	2%	2%	2%	2%
Total	100%	100%	100%	100%	100%	100%

Source: AMR Research, 2008

Table 15: PLM and CAD application revenue growth rates by geographic region, 2007–2012

Region	Growth Rate, 2007	Growth Rate, 2008	Growth Rate, 2009	Growth Rate, 2010	Growth Rate, 2011	Growth Rate, 2012	Five-Year CAGR
North America	2%	3%	8%	8%	8%	9%	7%
Europe	7%	5%	5%	5%	5%	4%	5%
Asia-Pacific	27%	20%	13%	13%	13%	13%	14%
Latin America	54%	56%	31%	27%	25%	19%	31%
Rest of World	10%	14%	13%	16%	16%	15%	15%
Total	10%	9%	9%	9%	9%	9%	9%

Source: AMR Research, 2008

Appendix A: Research methodology

AMR Research's Quantitative Research group tracks the enterprise software market from the bottom up. For this purpose, we have developed a database of software vendors that provide applications to enterprises worldwide.

Selection criteria for application software vendors

AMR Research's goal is to capture the leading 90% (by revenue) of enterprise application software vendors that are actively pursuing business within the United States. To be included in AMR Research's effort, vendors must meet the following qualifications:

- Develop and sell packaged application software products either directly to end users or through a third-party distribution channel (this excludes third-party distributors and developers that OEM source code exclusively)
- Achieve a minimum of \$1M in total annual revenue or provide a fast-growing new technology or functionality—for example, Internet-enabled APS applications
- Provide packaged software applications in the following segments: ERP, supply management (formerly procurement and sourcing), supply chain management, customer management, human capital management, and product lifecycle management
- Provide systems hardware as part of a turnkey solution only (this excludes hardware vendors like **Sun**, which does not provide application software)
- Provide implementation services, including consulting, customization, system integration, and training, as part of its application software business and not as stand-alone services only

Information collection

Information on application software vendors is derived from a number of sources:

- Electronic software vendor survey link, distributed in February
- End-user surveys that detail application software suppliers and company spending
- Vendor and end-user communications with AMR Research
- Annual reports, 10Ks, 10Qs, and IPO prospectuses
- Trade publications, seminars, and conferences
- The Internet

AMR Research has developed an electronic Vendor Information Request survey form that is distributed via e-mail to each company in our software vendor database. We then follow up with these companies to ensure the timely completion of the completed survey. Inconsistencies or questions are resolved between AMR Research and each company before the data is finalized our database.

It is easier to gather detailed company information from publicly held companies or those close to filing IPOs than from privately held companies. In cases where companies do not share performance information with AMR Research, we estimate financial information based on a number of factors. These include, but are not limited to, customer information, information by business partners, competitors, resellers, and analyst estimates. AMR Research shares these estimates with the company for confirmation or correction before entering them into the database.

Database for software vendors

Based on the selection criteria outlined above, AMR Research has built a software vendor database that provides detailed information for each company on the following metrics (we do not quantitatively publish all of the metric data listed below in our reports):

- Total company revenue and revenue by product type (software licenses, hosting or subscription, maintenance, implementation, hardware, and other)
- Number of existing and new customers
- Software revenue by application segments
- Software revenue by database management system
- Software revenue by customer size
- Software revenue by geographic region
- Software revenue by vertical industry

Company revenue by revenue type

Most application software vendors sell more than software licenses. They also provide installation, implementation, training, and other services, including turnkey solutions. In order to understand a software vendor's business model and its future revenue potential, AMR Research determines the share of its revenue derived from each of the following segments:

- Application software licenses generally provide the highest profitability and signal future growth opportunities. Application software license revenue can be derived either from licenses paid in full or from one-year license fees/leases. Application software license revenue does not include revenue from middleware, database runtime licenses, or one-of-a-kind software products developed for a specific customer.

- Alternate pricing delivery revenue captures revenue that is not perpetual or term for application service providers. This includes subscription, hosting and software as a Service (SaaS).
- Software maintenance provides a stable revenue stream. However, a maintenance share higher than industry average can indicate a lack of new customer growth or market momentum. Generally, software maintenance includes free upgrades, bug fixes, access to bulletin boards, and some software support. It does not include implementation service, training, consulting, software customization, or custom development, among other things.
- Revenue from implementation services, training, consulting, and custom development, among others, is harder to manage and generally provides lower profitability than software licenses. Most application software vendors prefer to hand off a share of these revenue opportunities to system integrators or value-added resellers.
- Revenue from computer hardware sold by software vendors has been decreasing the last few years. However, market niches remain for midrange manufacturers that demand complete systems. AMR Research does not include computer hardware sold without application software by companies like Sun in this Report.

Application segments

Enterprise management

- Core ERP (including core financials)
- Finance and revenue management (stand alone)

Supply chain management

- Order fulfillment
- Transportation management
- Global trade management
- Warehouse management
- Production and distribution planning
- Demand planning
- Sales and operations planning
- Inventory optimization
- Service parts management and planning
- Supply chain performance management
- B2B collaborative technologies

Customer management

- Marketing automation
- Sales force automation
- Customer service

Human capital management

- Core HR
- Workforce Acquisition (formerly Talent Acquisition and Recruiting)
- Workforce Management (formerly Scheduling Optimization and Professional Services)
- Workforce Development
- Workforce Assessment (formerly Employee Performance Management and Enterprise Incentive Management)

Product lifecycle management

- Product data management
- Portfolio management/program management/decision support
- Collaborative design/engineering
- Customer needs management
- CAD/CAM

Supply management (formerly sourcing and procurement)

- Indirect procurement management
- Direct procurement management
- Sourcing
- Contract management
- Financial settlement (formerly procure to pay)
- Supplier performance management

Geographic revenue distribution

AMR Research provides information on vendors' worldwide revenue distribution by five main geographic regions. (Vendors included in this analysis are active within the United States and Europe, although their headquarters may be elsewhere.)

- North America—United States, Canada
- Europe—Western and Eastern Europe, including Russia and other parts of the former Soviet Union
- Asia-Pacific—Australia, China, Hong Kong, India, Japan, Korea, New Zealand, Singapore, Taiwan, Thailand, among others
- Latin America—Mexico, Central America, the Caribbean, and all of South America
- Rest of World—e.g., Africa, the Middle East

Customer base by revenue size

AMR Research reports on application software revenue derived from sales to companies within the following ranges of annual revenue:

- Less than \$30M
- \$30M to \$250M
- \$250M to \$1B
- \$1B or more

This allows AMR Research to be up to date with trends relating to the movement toward the middle market.

Forecasting

AMR Research forecasts are developed by us with input from a number of sources:

- Vendors' own growth expectations
- End-user spending plans
- Wall Street analysis
- AMR Research's competitive analysis
- Regional and worldwide economic growth expectations

The five-year forecast focuses on revenue of all major software vendors active within the United States and Europe, based on long-term growth expectations. These growth projections are primarily based on the following factors:

- Past and present performance by application segment
- End-user IT investment plans
- Emerging/declining technologies
- Worldwide business drivers

Research and Advice That Matter

AMR Research is the No. 1 independent advisory firm serving supply chain, operations, and technology executives. Founded in 1986, AMR Research focuses on the intersection of business processes with value chain and enterprise technologies. We provide our clients in the consumer products, life sciences, manufacturing, retail, and technology sectors with subscription advisory services and expert-led Peer Forums. To learn more about our research and services, please visit www.amrresearch.com.

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



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