

PLM IN PLAY

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CIO Decisions
May 1, 2007

http://searchcio.techtarget.com/magItem/0,291266,sid19_gci1252914_idx1,00.html

No longer the pricey province of large companies, product lifecycle management software is now less costly and complex -- and ready to speed product design and global workflow in the midmarket.

Frank McMaster had a lot on his mind one day last fall as he looked around the table at Ashworth Inc.'s other top executives. The VP of IT for the \$209-million golf apparel maker had a trio of technology initiatives actively in play: a new business intelligence system, an enterprise resource planning (ERP) rollout and a mobile salesforce system.

He was sitting next to his boss, the new CEO who was brought in to rejuvenate the company's heritage business in selling high-end attire at golf courses and country club pro shops. The walls of the conference room were papered with charts, spreadsheets and presentations. The conversation eventually zeroed in on the inventory and production issues that had plagued the Carlsbad, Calif.-based retailer in recent years.

"The major business owners were telling us what's critical to them and where the gaps were," McMaster recalls. "We were talking about production and design and about nobody having the visibility they needed across the company."

Suddenly the IT chief knew exactly what they needed. "I leaned over to the CEO and said, 'I'm not going to develop this. It's a PLM system. We should just buy one.'"

Only a few years ago, the notion of installing product lifecycle management (PLM) software in a midsized company like Ashworth would have been a case of crazy overkill. "Just the term 'PLM' used to scare midmarket companies away," says Michael Burkett, vice president of PLM research for AMR Research Inc. "They'd say, 'That's something Boeing puts in place.'"

But no one's saying that anymore. Today the midmarket accounts for at least \$2.5 billion (or about 45%) of the PLM software sold annually, according to AMR. And these numbers don't even include the \$5-billion computer-aided design (CAD) segment of the market, where many smaller enterprises often get their start on engineering and design workstations. Among midsized manufacturers, AMR expects 12% annual growth in PLM spending, versus 9% for the PLM market as a whole.

Product lifecycle management enables companies to manage and support all the information surrounding their various products and parts -- from initial design and engineering diagrams to bills of material, manufacturing documents, sourcing details and maintenance data. For midmarket and smaller enterprises, many vendors sell PLM as preconfigured software templates. These templates are geared to vertical industries in which CAD systems are integral to the manufacturing or design process.

Several macroeconomic trends are fueling the PLM market, including the offshoring of facilities and expansion of outsourcing and contract manufacturing overseas; escalating mergers and acquisitions within multiple business sectors; and the inexorable tide of regulatory and

compliance laws. As if that weren't enough, toss in the relentless pressure to innovate with products that have shorter lifecycles than ever, especially in electronics and consumable goods, and the perfect manufacturing storm rolls onshore.

"The combination of those trends is what's new," says Roy Wildeman, a senior analyst with Forrester Research Inc. "Compliance combined with outsourcing -- and the challenges that creates -- or outsourcing and innovation pressures combined with shorter product lifecycles. We have a whole different combination of complexities going on today."

What PLM software brings to the storm center is the chance to enable company-wide collaboration to create whatever products are in play. "PLM is providing marketing, production, sales, services, even external suppliers, with increased visibility and engagement in the product development decision making," Wildeman explains.

Smaller companies often start with basic product data management to provide broader access and reliable documentation, Burkett notes. Once the data is under control, more sophisticated workflow, collaborative design and program management follow.

"There's a misconception that midmarket manufacturers are simpler operations," the analyst says. "Sometimes they're actually more complicated than much larger enterprises, because so much of the complex design stuff gets outsourced to them through the supply chain."

PLM in Action

"Our PLM stuff is our No. 1 system -- way more important than ERP because we're still a fairly young company. We're doing a lot of R&D, and we're still developing products," says Brian Sossaman, IT director at ReliOn Inc., a fuel cell manufacturer in Spokane, Wash. The company provides major telco providers, government sites and utilities with fuel cells for emergency and backup power.

Like most of the midmarket companies interviewed for this story, ReliOn turned to its key engineers to vet a short list of potential vendors before it selected Omnify Software of Andover, Mass. "We're in IT, not in the mechanical or electrical engineering groups," Sossaman points out. "They know what they're after."

With no small measure of relief, several IT executives interviewed for this story note how smoothly their PLM implementations have gone, especially when compared with past ERP projects. "The difference between PLM and ERP is really your target audience," Sossaman says. "You've got engineers on PLM and operations folks and accountants on ERP; those users are just not as technically savvy."

A PLM system is composed of several elements, including foundational technologies like extensible markup language (XML) or enterprise application integration; core functions such as data vaults, document and content management, workflow and program management; and information authoring tools and functional applications. PLM's set of highly configurable software modules run on various database platforms (Oracle, SQL Server and others) and are integrated with underlying engineering, design and product data management systems. The factor that distinguishes PLM from ERP is a tight focus on products rather than transactional business operations. PLM software is designed to handle the swiftly changing, unstructured data associated with product design, while ERP manages financial or inventory data.

At its best, a PLM system delivers both technical and strategic benefits to the business of making or moving products around the country and across the globe. At its worst, a PLM system can echo all the misery of a failed ERP project, such as integration problems; the complexities of network security, IT architectural design and data access; and the hurdles of defending the software's ROI to the business.

Indeed, many CIOs and vendors agree that showing a return on investment for PLM can be tricky: It's more likely that with PLM in place a company will avoid incurring costs rather than actually achieve cost savings. "It's tough to quantify ROI, because it's tough to quantify people's time, and that's ultimately what PLM systems do; they save time," says CTO Chuck Cimalore of Omnify Software. It's also hard to argue that PLM is a mission-critical application since so many companies have gotten by with a mishmash of point products and Excel spreadsheets. "It's when they reach that critical point of too many product lines and too many issues that they need to automate," Cimalore adds. "We have to help them prove out this technology."

Another concern about PLM is that many of the applications are Web based, which users say can open the door to security breaches if these applications haven't been written with vulnerabilities like cross-site scripting, SQL injection or cookie tampering in mind.

Still, trying to master a mountain of product information without PLM is "very painful," laments one IT director from a midsized manufacturer of telecom equipment. "What you end up with is a lot of parts to manage in your ERP and engineering systems with no real lifecycle tracking for those products," says this IT director, who spoke on condition of anonymity. "I can see PLM being hugely beneficial for us, but I've learned the hard way that I have to get the line-of-business people to say they really need it first." And then, of course, get them to pay for it.

Price Tags and Pressures

For midsized companies, the range of PLM options is widening. At the low-cost end, there are on-demand providers, which offer remote hosting and charge as little as a few hundred dollars per user annually. At the high end, more traditional enterprise software providers offer options that can cost between \$50,000 and \$100,000.

Since the early 2000s, the technology has become more affordable, easier to install and less complex to manage, says Ken Amann, director of research for CIMdata Inc., an Ann Arbor, Mich.-based analysis and consulting firm specializing in PLM. Yet vendors are still learning how to package PLM appropriately for the midmarket and its diverse levels of IT capabilities, says Amann, whose firm tracks some 300 PLM providers. Competition for smaller enterprises also means that "a lot of new vendors are attacking this marketplace, putting pressure on the big guys to come down." (For more on pricing, see "Vetting PLM Vendors," at right)

A typical midsized customer starting out with PLM vendor Agile Software Corp.'s on-demand offering, for example, will spend "between \$8,000 to \$20,000 max, including implementation costs," says Craig Livingston, general manager of SME solutions for the San José, Calif.-based firm. The traditional on-premises approach (with a variety of licensing options) starts at between \$20,000 and \$50,000, with an additional \$10,000 to \$20,000 for implementation and training, he adds.

"Depending on what you want to do, \$200,000 to \$300,000 will get you to a meaningful implementation," says Mike Segal, a senior VP with Enovia MatrixOne, the PLM division of Dassault Systèmes A "full-blown PLM system with program management and supply chain hookup" will run \$3,000 to \$4,000 per seat, he adds.

Vendors that serve both enterprise and midmarket companies notice some practical differences in these customers' respective mind-sets. "In large enterprises, you walk in and deal with big customers who already have best-in-class processes in place. They want your system to fit their processes and be completely customizable," notes Bruce Boes, VP of Velocity Series marketing for UGS Corp. "Smaller customers want best-in-class processes dropped on the desktop to plug and go."

Enterprise-level PLM users "almost don't care what it costs" to get the job done, Boes adds, "But the smaller customer says, 'Hey, I have a problem, but if I can't afford [your software], there's no point in talking.'"

Ashworth's Frank McMaster can relate to that perspective. "My budget for this [project] is a couple hundred thousand, definitely under half a million," he says bluntly. "Anyone who came in here talking six months and more than half a million, I ruled them out."

McMaster's survey of the PLM market left him convinced that these systems "basically all do the same things." He wants something Web-based, easy to integrate with his ERP system and configured to serve his apparel business. The last thing he wants is a top-of-the-line model. "We're coming from spreadsheets here," he says. "I don't want to buy a Cadillac; I want a Ford."

Vendors and industry analysts alike agree that taking the on-demand or Software as a Service route to PLM will cost about one-third what traditional, on-premises software does. But they hasten to note that for most users, concerns about data security, control and protection of intellectual property loom large.

Some 270 small and midmarket companies have surmounted these concerns with Arena Solutions Inc. in Foster City, Calif., the most prominent on-demand provider of PLM software. "Competitively, we lose mostly to Excel spreadsheets. This market is still maturing," says Arena CEO Michael Topolovac. "There are 100,000 companies out there that need PLM but only a few thousand who have bought it."

For Arena's customers, the average deal runs \$25,000 to \$30,000, though some start as low as \$5,000. "When you buy a traditional \$100,000 PLM software system, you can spend that same amount in IT infrastructure, maintenance and personnel just to run the system," Topolovac says. "With on-demand, that cost is zero."

Color Kinetics Inc. in Boston counts itself among the on-demand faithful. The \$53-million maker of digital lighting products signed on as Arena's second customer back in 2001, just as the dot-com bubble burst and the notion of storing confidential data on someone else's system was "pretty scary," as CTO Fritz Morgan puts it. "We figured worst case, if they didn't make it, we'd at least get all our data into a structured format and could export it to another PLM system," he says.

"But we badly needed a system we could get on anywhere in the world with Web access," says Morgan, who was then VP of engineering. He got demo accounts for three different systems and threw them to his engineering wolves. "Ultimately, if the engineers aren't into it, a system is pointless," he says, echoing a common wisdom about PLM systems.

Arena's offering was also the most affordable choice for a company that was still privately held and not yet profitable. Currently, the company pays about \$1,000 per Arena seat annually. Today Color Kinetics stores product information for more than 10,000 parts with Arena. "Our vendors in China are all online with this system. They love it because they can use it without any special software," Morgan notes. "What the IT department loves about this is not having to deal with it at all."

Getting Executive Buy-In

Another shift overtaking midmarket PLM involves decision makers. While the products are still quite engineering-centric, "more people are touching PLM applications who are not engineers," analyst Amann says. "We're starting to see more decision makers involved from the CIO and CXO level."

CIO Jan LaHayne of Littelfuse Inc. ended up front and center in the PLM decision-making process at her company, the world's No. 1 fuse maker, according to Hoover's. Headquartered outside Chicago, the \$535-million firm has more than 10,000 customers in 32 locations around the world. In the warp-speed electronics business, products can move through an entire lifecycle in less than 18 months.

"You really need good PLM software, because you're moving on new product development all the time," LaHayne says, noting how product design has become globalized and multidisciplinary. "All this data used to be on paper in file folders, which were relatively easy to deal with in one location, with one engineering department. But now you may have customers in Asia who want the designs done in Germany or elsewhere in Asia. Everyone now has to see the concept, look at the drawings and understand all the pieces."

In 2004, Littelfuse started kicking the PLM tires, but it took until 2006 to pilot UGS Corp.'s TeamCenter, an enterprise-level product installed at companies as large as Lockheed Martin Aeronautics Co. "We dragged our feet a bit, probably because we didn't have the right sponsorship to help us understand the next place we needed to go," says LaHayne. "The engineering group saw it mainly as a way to organize their CAD drawings and spec sheets. Like an electronic filing cabinet." That myopic view changed once a leading engineer -- Jay Harris, now a global director of product management -- took up the cause of selling PLM to the business by emphasizing its marketing, quality-control and sales opportunities instead. The two joined forces to sell the board on a project that will likely cost about \$350,000 once it wraps up later this year.

"The first tangible benefit that comes to mind is the connectivity," Harris says. "Part of our growth at Littelfuse is tied to acquisitions, and every time you acquire a company you know you'll get some new data management system. Everyone has different CAD systems, for example. So how do you maintain traceability and control of that data? TeamCenter is platform-agnostic, so it doesn't care where the data comes from. As we're looking to the future and continuing to expand globally, we've now got this system to plug in whatever data we need."

The ability to access this data from multiple engineering systems also brings a wealth of historical knowledge to bear on new product development, the CIO adds. "Someone may say, 'Hey, I can do that in nickel versus palladium,' and you have all that history to find out what happened in past testing with heat or torque. You can save yourself a lot of time and money."

LaHayne's most serious concern about the UGS software was that it required an Oracle database platform, which she didn't want to support at her predominantly SQL Server shop. "I know plenty of CIOs who run on Oracle happily, but we avoid it because of the overhead cost of those outsourced Oracle DBAs [database administrators]," she explains. The fact that UGS was adding a SQL Server version to which Littelfuse could migrate eased this issue, however.

There is also a shift taking place among the types of industries most likely to benefit from PLM capabilities. Joining the early adopters among large automakers, manufacturers and members of the aerospace industry are now scores of companies in fabrication and assembly, consumer product goods, retail, high tech, and electronics.

Photon Dynamics Inc. in San José, Calif., now uses a PLM system from Agile Software to manage product information -- but not the manufacturing, sourcing or support segments of the product lifecycle. "We use other products for those phases," says CIO Lee Penning, who rolled out the new system to 160 users in May 2006. "We're at the beginning of the PLM journey."

A bad experience with a previous product fueled a certain cynicism about PLM at Photon Dynamics, which manufactures inspection and testing equipment for flat-panel displays made by customers such as Samsung Electronics and Sharp Corp. But the company still needed a system capable of reliably tracking tens of thousands of parts and all their associated changes and revisions.

"Once you get this implemented, the business benefit comes in having truly one source for your data," Penning notes. "It really streamlines inventory management. It's not a point solution; it's a strategic, all-encompassing change."

Given the competitiveness and constant change in the consumer electronics industry -- where customers change glass screen sizes every six months -- Photon operates within a "very short design cycle" that generates a steady stream of new parts numbers, explains Leay Heck, manager of engineering services. "We customized the Agile Software [product] to meet our processes, which were manual. Now we've got more visibility of change management," she adds.

"Just having the traceability of changes and access to all the documentation has been a huge improvement."

"We really emphasized the training on the initial rollout," says Brent Jones, manager of business applications and one of eight IT staffers at Photon. "By the time we finished the implementation, we had such a good footing with the training it helped out a lot with the perception of the project as a success."

Heck recalls how she knew the rollout was a success after one of her engineers stopped her in the hallway and said, "I like it so much it made me want to cry."

Sidebar

Vetting PLM Vendors

With nearly 300 vendors in the product lifecycle management (PLM) software market, choosing a system for your midsize company can seem overwhelming.

For reliable advice, start with your own engineers and product designers -- and keep them involved every step of the way. "We're in IT, not mechanical or electrical engineering," says IT Director Brian Sossaman at ReliOn Inc. in Spokane, Wash. "They know what they're after, so get their input. It makes things so much smoother."

Next, survey your own industry. Frank McMaster, VP of IT at Carlsbad, Calif.-based Ashworth Inc., began his recent search for a PLM vendor by thumbing through issues of Apparel magazine and creating a short list from the retail IT companies advertising in the magazine's pages. Finally, he narrowed the field from half a dozen contenders to two finalists.

Navigating the Vendor Universe

Analysts from CIMdata Inc. in Ann Arbor, Mich., divvy up the PLM vendor world into three categories: comprehensive providers, focused applications vendors and tool suppliers. They further divide the PLM field into vendors that supply primarily computer-aided design (CAD) products and those that sell non-CAD PLM software, which manages product data in a broader lifecycle and includes program management and customer feedback capabilities.

The comprehensive PLM vendors -- those leading the enterprise market and generating the most revenue -- are IBM (through its software partner IBM), UGS Corp., Parametric Technology Corp. (PTC), SAP AG, **Agile Software Corp.** and Enovia MatrixOne (now owned by Dassault). According to AMR Research, other leaders include Lectra Systems Inc., Gerber Technology, MSC Software Corp. and Telelogic AB.

Although many of these vendors have midmarket strategies and product lines, those best known among midsize companies are Agile Software, UGS, PTC and MatrixOne, analysts say. For customers that don't want to own or operate their own PLM systems, vendors such as **Agile** will offer on-demand capabilities. But the clear leader in the pure-play on-demand PLM space is Arena Solutions Inc.

One challenge for software providers is "getting customers to really question the vendors," says CTO Chuck Cimalore of Omnify Software in Andover, Mass. "Any vendor will say, 'Sure, we can integrate with your systems,' but have they actually done it before? How easy was it?"

Cimalore notes that when engineering or operations groups leave IT out of the evaluation process, it makes a vendor's job far more difficult. "The IT group isn't always involved," the CTO says. "But it's the IT group that will challenge the vendor. They're the ones who know to ask the tough questions and drill into vendor weak spots."