



## Product lifecycle management systems and their predecessors have been threatening to take over enterprise IT for years. Brian Tingham looks at what's happening as mid-range PLM starts to prove its ROI

**G**lobalisation, cost pressures, product variety and options, complexity, time to market, design re-use, electronic collaboration, technology advances, after-market: there are plenty of good reasons – particularly for engineering-centric manufacturers – to be using PLM (product lifecycle management) software tools and suites today. But they're not; at least firms south of the big boys aren't.

More accurately, they don't see themselves as doing so. Market researcher Benchmark finds just 4% of IT managers seeing either PLM or its predecessor PDM (product data management – the engineering data subset of PLM) as a significant or major priority. In another survey of engineering design managers, Benchmark recorded only 2% indicating plans to purchase PLM tools in the next 12 months, while 64% said

indicates that the challenges have largely moved on.

He suggests that 85% of IT spending in manufacturing is aimed at controlling what he terms 'indirect' costs – order management, inventory management, supply chain management etc – and only 15% at direct cost controls and revenue improvement.

It's an extreme view, but he believes that ERP and the like are the wrong weapons to help businesses now, because revenue and direct costs (which "are 60–70% of total costs") are much less a function of ERP, than CAD/PLM. They're all about product competitiveness and hence design, engineering re-use and the rest. "The key to fundamentally lowering direct costs is to address the real source ... namely the early decisions that are made on how a product should be developed."

But let's step back. Peter Bilello, who heads up consulting services for international specialist PLM analyst CIMdata, defines PLM as: "a strategic system for the creation, management and dissemination of product defi-

# PLM: evolving tools for an evolving

they definitely wouldn't be buying PLM – and 34% were blissfully ignorant. Indeed, Benchmark found 44% saying they "weren't really familiar with PLM"!

While SMEs are certainly grappling with and solving problems relating to the above business realities with what we might choose to call PLM tools (although they don't), by and large they categorically aren't buying into anything like the overall PLM vision – yet. Even though the few among their peers that have done so, can demonstrate enviable return on investment (ROI).

Looking at those benefits, they include: faster time to market through collaborative and concurrent working, engineering re-use and the rest; better business responsiveness and flexibility in the face of change, through workflow and centralised access to data; reduced product development and operational costs; product quality improvements; better customer service; better productivity from across the business; opportunities to serve new markets, or existing markets better; and improved profits! It's an extensive list.

Sounds compelling? It's not that industry hasn't invested in what it sees as appropriate IT: of course it has, and ERP and associated production, operations and business management systems have been the main beneficiaries. But it's worth listening to Dave Burdick here. Burdick, who was vice president for analyst Gartner's Manufacturing Applications Strategies Service, and now runs PLM consultancy Collaborative Visions,

covering mechanical and electrical components, documents, software configuration, and all associated processes throughout the as-built, as-shipped and as-maintained lifecycle, all the way from requirements management, starting with customers."

Take a deep breath. Why do you need such an overarching system? "Because all companies create IP [intellectual property] assets and transfer them into deliverable assets ... but if you ask them 'How do you do that?', their people don't know." And he's referring to the big picture of managing everything from conceptual product design, through all the facets of development, change control, manufacturing engineering, production, subcontract, supply chain, documentation, maintenance and the rest. Nobody knows.

All of that is your IP, and almost invariably there is no consistent system managing anything like all of it – or even communicating anything as simple as status to other operational systems. That's what PLM should be doing. No wonder we're not that great at making the most of what we have.

So why aren't we using it? Nick Ballard, senior PLM consultant at UK CAD/CAM/PLM analyst Cambashi, says: "PLM as an issue, or a distinct topic in its own right, is pushing the definition too far." His point is that doing an education job for grand-plan PLM is very long and too hard. And, as Allan Behrens, formerly vice chairman of CAD vendor Cadtek, now also with Cam-

### Business Benefits

- Faster time to market via teamwork
- Better, faster customer service
- Improved flexibility and business responsiveness
- Cut development and operations costs

bashi, says: "Each software vendor has a different slant on what it believes are the deliverables." So users are also hard pressed to make sense of conflicting advice.

There's also scepticism and justifiable cynicism. Ballard: "PDM was going to be the great white hope, but it didn't happen for most of industry." So why should PLM be any different? His answer: British manufacturing needs it more now. "If you don't organise your documents and data internally now around engineering processes and product structures throughout your business, what hope have you got of wider, efficient use of your know-how?" How will you do more with less?

### PLM components

PLM needs to be broken down into, for example, managing data and workflow, and the business benefits that come from that. For Behrens, that starts thus: "It's about making information accessible to others outside engineering itself." And he returns to his point: "That means different things to different vendors. SAP, for example, provides its PLM product definition in terms of the engineered BoM [bill of materials], specified and defined. Other vendors, like IBM/Dassault, say you need to maintain multiple aspects of the truth [with] product definition starting right back at the design concept

stage and then going on out through service to product retirement."

The point: you do need a system to provide a single version of the truth, but also multiple extrapolations of it. Call it what you like, the thinking behind PLM is important – but so is applying that to your situation. So an initial PLM project might only be on data and document management, with everything perhaps automatically reproduced for the different functions – production, sales, service and so on. It begins to look like ERP, with 'modules' and connectivity for everything operational around any manufacturing business.

Ballard reckons that if, for example, you're in a business where a specification is relatively straightforward and doesn't require too many design iterations, then maybe the emphasis has to be on getting from design to manufacture quickly. "In that case your IP would be in production engineering." But if you're looking at an engineer-to-order project, you need some way of managing the product data and project planning together. As Behrens says: "You want your system to work with Microsoft Project, for example, so that you can see everything as one view."

Then when it comes to production, increasingly there's the control of collaborative manufacturing, sourcing and so on. "One of the reasons people are now looking at PLM – quite apart from design and engineering having to change more quickly – is that manufacturers are choosing to outsource their manufacturing around the world, with base product being manufactured anywhere," says Ballard. ▶

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Nick Ballard, Cambashi

Allan Behrens (left) and Nick Ballard of Cambashi

# market?





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► And Behrens adds another reason: “Especially in the automotive and electronics industries there are a number of different design suppliers, component suppliers and manufacturing suppliers, each with their own regulatory environments, their own software and so on. How else do you manage all of that?”

Look at Nokia. It's a big PLM user, not least because it needs to be sure it's got the right software configuration with the right model to match today's promotions. And there are European directives around disposal – with companies needing to track and trace handsets and provide audit trails – as well as issues around maintenance, or managing mid-life product life extensions when they're out in the field.

As Behrens says: “Then you need information on the as-serviced, as opposed to as-manufactured configuration. What's the upgrade history for that model?” And he adds: “I've seen what I would consider to be PLM initiatives which others would argue were CRM [customer relationship management]. What they're trying to do is get customer requirements to the design team more quickly.” There it's about improving workflow, so they're informed of issues from customers, and providing parts analysis, supplier analysis and so on.

Whatever, PLM needs to happen for SMEs too, otherwise we're going to be stuck with the old ways of design, engineering, production operations and service working more or less separately and throwing work over the metaphorical wall, with all the waste and missed opportunities that entails. So what of the PLM type products out there to help them?

Behrens cites Solidworks' e-drawings package as a useful PLM component that does a job. “Collaborators can see how [assemblies] are being put together, without having to run the application on their desktops, and then provide electronic feedback.” Similarly, there are products like those from CoCreate that aim to ease specific aspects of collaboration simply by providing multi-media web-centric workspaces – good for subcontractors and the like.

They're not the single digital, global, all-singing, all-dancing view enshrined in the big-picture concept of PLM, but they're pragmatic

solutions to real engineering issues. They also don't address any need to bring information together when there are multiple CAD systems. And design intent isn't captured, so they do little for PLM's re-use of engineering effort promise.

On the other hand, 'pure play' PLM systems, like those from MatrixOne and Smarteam, are doing an excellent job for early adopter SMEs, and providing the cherished single overall view at a realistic cost. “With these, quality assurance, production, service in the field, can all look at the original requirement, definition and specification for their own purposes,” says Behrens.

All well and good, but for any of this – either point solutions or more full-blown PLM – to spread to SMEs at anything like a significant rate, the software vendors and their products and marketing messages are going to have to reflect recognised basic issues more clearly and, just as important, deliver short-term ROI. Which, as Behrens intimates, is a challenge for the likes of PTC, UGS and Dassault. “They've got a big scaling issue.”

### Keep it simple, stupid

Better technology helps, but it's not enough. Going web-centric, and thus cutting the infrastructure costs while making the systems easier to implement and use, also isn't apparently enough. Look at PTC's experience with its Windchill PLM suite. As Ballard says, it stripped away the cost and complexity of client/server architectures, “but it didn't pay off for them.”

Behrens believes it's simple: “If SMEs can see that something they need to do becomes easier another way, then they'll do it. [PLM] needs to be focused on their business and departmental issues and it has to be easy to implement and use... Autodesk, for example, is starting to do well here because it's pushing aspects of PLM for specific industries, and being pragmatic in addressing ROI.” And he gives examples of the firm's secure vaulting access and project access offerings, and pushing DWF (Design Web Format for document exchange) formats as being useful initiatives.

The power of Autodesk's approach is that it provides solutions to smaller problems, like enabling rationalisation and sharing data with subcontractors. Behrens: “They won't be at the highest level, but for SMEs they provide the easiest messages and the clearest ROI.” And again, there's no harm in that. If you stick at the CAD management and a few collaboration tools level, you can make a phenomenal first leap.

That's going to be the way of it: how vendors disseminate and deliver the PLM vision with users will dictate uptake. Once the metaphorical ball is rolling, understanding of that '85%' is going to fall into place, and we'll maybe see PLM move onto the business agenda from, well, effectively nowhere. As Behrens puts it: “Until applications on the scale of grand PLM can be moved from a Ford to a small crane manufacturer in Chapel-en-le-Frith and mean something to him, it's not going to happen.” Perceived barriers will remain that it costs too much and that it's too hard to change the processes throughout the end-to-end lifecycle. ■

