

**The PLM Debate**  
**2002**  
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As part of our ongoing research programme, Cambashi is running a debate on product lifecycle management (PLM) and how it interfaces with the supply chain. Various IT vendors were invited to respond to the following discussion paper.

**Outsourcing upsets the IT integration pillars in the temple of discrete manufacturing**  
**In 2004, will PLM and SCM still be recognisable TLAs?**

**Introduction**

This spring, IT vendors and industry analysts are pitching a 'strategic vision' to discrete manufacturing that includes some kind of diagram with four independent "pillars" of systems supporting the user company:

- Product Lifecycle Management (PLM) to create and document the products being designed and the processes to manufacture them.
- Customer Relationship Management (CRM) to identify customers and prospects for the enterprise, to provide a complete picture of contacts with them and enhance communications effectiveness.
- Supply chain Management (SCM) to optimise the capital tied up in inventory and their unit costs. SCM encompasses inward and outward logistics systems that acquire materials to make products and ship finished goods to customers.
- Enterprise Resources Planning (ERP) to provide a single financial view, for as many departments as possible, of internal and external transactions that either add value or transform the status or location of a product, part or asset. ERP is often disguised as a new more fashionable acronym.

Of course these independent systems are depicted as "integrated" - a much-devalued word in IT circles. In combination these applications are sometimes referred to by the acronym Computer Integrated Enterprise (CIE).

Our research has found considerable confusion among IT users as to the meaning of these terms and significant doubts as to whether or not PLM in particular will be an application they will buy. It is the irresistible rise of design and manufacturing outsourcing that spoils these diagrams for Cambashi's team of consultants.

## **Outsourcing**

We regard outsourcing as an inevitable economic trend going back to Adam Smith's specialised pin makers. In business, success is about taking reasonable risks. To manage risk you have to understand what you are doing. Dot.com investors, please take note. The most successful firms focus on doing what they know best and finding others who know best for everything else.

Outsourcers live in a virtuous circle. As they specialise and carry out tasks on a regular basis they become more effective. They learn more, they re-use know-how and rationalise parts and processes to drive down costs. However, the desire of one enterprise in the network to rationalise may conflict with similar efforts of others. Part of the value of the outsourcee is to avoid sub-optimisation and to maintain orderly interfaces. However, to date this has proved problematic.

A classic case of the success and failures of outsourcing can be found in Booz Allen's paper "Outsourcing and its perils" <http://www.strategy-business.com/> where Cisco, Compaq and other electronics Original Equipment Manufacturers (OEM) relationships with the Contract Electronics Manufacturers (CEM) like Celestica and Flextronics are analysed. Their agendas were misaligned leading to huge write offs. As the paper explains, "Although the CEMs and the OEMs were able to create a balance of cost and capacity at the outset of their relationship, their plan was destroyed by market and supply variability."

For each outsource decision there is a trade off between the improvement in unit cost and the cost of the outsourcing transaction. As we communicate better, the balance of the trade off moves in favour of outsourcing. IT is simply the latest innovation in communications. To hear some marketeers talk, you would think outsourcing is a result of a new invention in collaborative IT. We believe, however, that outsourcing is a more basic economic phenomenon. It happily provides an opportunity to sell more and new IT applications and systems, including collaboration.

## **How many and which pillars hold up industry?**

Vendors struggle to establish themselves as the leader in a pillar. It is fairly clear who are the leading companies in the ERP and CRM pillars: SAP and Siebel. It is less clear who is the leader in the SCM pillar, it is even less clear who might be the leader in the PLM pillar and indeed there is doubt that this pillar really exists.

PLM might simply be a module from ERP or SCM companies. Leading ERP vendors, SAP and Baan, have offered PLM modules for some time. In January, Oracle introduced a new collaboration tool. i2 acquired Aspect Development in 1999, the leader in parts rationalisation. As yet, Manugistics and Peoplesoft do not have relevant functionality, but the latter has said that it is on the acquisition trail. Even middleware vendors are getting in on the act with BEA, IBM's software division, and Microsoft all trying to provide the infrastructure for workflow and connectivity.

The most active proponents of PLM as a separate pillar are the former CAD suppliers. When we research the topic with users they certainly admit to confusion. At the top level they are not sure that the CAD derived PLM is the same thing as the ERP vendors PLM modules.

In a recent analyst briefing, PTC stated explicitly that they were establishing a new campaign - "ProductFirst®TM" with the objective of establishing their leadership in PLM. At the same time they dropped the equivalent term, Collaborative Product Commerce, which they have pioneered for the domain over the past four years. William Berutti, Senior VP of Business Development at PTC says that "PLM is the combination of systems for Create, Collaborate and Control, just as ERP is the combination of systems for Finance, Manufacturing and Distribution." They claim that only they have a comprehensive suite of products: Pro/E for Create and Windchill for Collaborate and Control.

In recent presentations, Bernard Charles, PDG of PLM software developer, Dassault Systemes, has suggested that the four pillars will become three. His view is that, in discrete manufacturing, "the SCM pillar will vanish into the PLM and ERP pillars." The logic is that you cannot optimise the supply chain without a lot of knowledge about the product. In food manufacturing, salt is mostly salt. In aerospace a bolt fastening the engines to a wing has geometry, tolerances, materials strength, modes of vibration and a host of other properties, which must be taken into account, before someone in the supply chain replaces it with an "equivalent" bolt. Cambashi agrees with the logic, even though we are not sure that SCM will vanish. It could be PLM!

### **Cambashi's industry network pillars**

We would like to see a completely different diagram that shows the inter-company communications being supported by systems just as important as the company centric ones.

Cambashi's diagram is drawn for an industry network, sometimes referred to by the acronym Computer Integrated Industry (CII). Rather than the pillars supporting the enterprise, the emphasis is on pillars supporting synchronization between enterprises. We see the future as:

Product Marketing. Support to make the decision to invest in developing a particular product. The system extracts information from customers and prospects of the network about demand and synchronises this with information about design possibilities and material costs from all over the network. This maps into aspects of enterprises' CRM systems, developed with elements of PLM, to deliver deeper insights and decision support.

Optimisation of Resources and Processes (ORP). Synchronization of the plans for demand, production, material acquisition, human resources and product distribution throughout the industry network for the product line. This is the industry network equivalent of integrated ERP and SCM, capable of optimising across enterprise boundaries, subject to business rules mediated between each enterprise.

Programme Management. Monitoring and controlling the acquisition and deployment of resources such as staff, indirect materials, services, capital and plant, to implement a plan that introduces new products and processes. While ORP is targeting everyday operations, Programme

Management is targeting change, and synchronizing efficient implementation of change among different parties in the industry network.

Management by Objectives. Synchronization of the efforts of the labour force across different industry network partners to act consistently on issues such as business change, external projection of product brand values, etc. Control systems engineers recognize the potential for instability in industry networks. Management by Objectives offers better solutions than the current delays and buffer stocks that dampen out that instability.

Of course, those of us with an office desktop, a home desktop, a laptop and a palm device, know that synchronization is not yet an "out of the box" package. As a result we recognise that the transition from Computer Integrated Enterprise to Computer Integrated Industry will take a considerable time.

Today, most CIE systems are limited to recording the current status rather than optimisation. They document what's happening so that humans can see the up to date situation and make better decisions. Getting a consistent up to date view of the situation is a first step towards optimisation. However, managers are paid to improve things, not simply to report what is happening. They need systems that assist them to do so. Today, few systems suggest possible courses of action, or provide "what if" simulations that show the outcome of decisions.

An important exception is SCM systems. The best use algorithms to optimise the trade off between price, delivery and safety stock. Similarly, production managers are used to graphical analysis of local shop floor 'what-if' scenarios. These capabilities begin to show the potential for similar support tools for managers who are handling complex partnering environments. As SCM has practical benefits in everyday operations, we regard reports of its likely demise to be exaggerated. Instead we see some development of SCM as the core of a new "strategic vision" diagram for next year.