

Is PLM applicable to AEC?

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Industrial users tell us that once they master their CAD tools to capture and document designs, the next step is to automate the flow of design information through their enterprise and its business partners. This has become the next white-hot application hope for packaged software vendors – PLM.

When we ask users what they mean by automating the flow of design information, we get a wide variety of answers. This may be because different users have different starting points on what are often huge projects. Alternatively there could be real differences between users. That would mean that PLM is a software project business where system integrators build applications on top of tools supplied by software vendors and not a packaged software business.

When we reviewed the Product Lifecycle Management (PLM) case studies in our library we found that the vast majority were from discrete manufacturing. Discrete manufacturing is only a fraction of all industry. This article explores the case for users to consider the same tools in an industry sector about the same size – Architecture, Engineering and Construction (AEC).

One thing is clear in the current climate. As, SAP said at the recent SAPPHERE conference, the only acronym that matters today is ROI – Return on Investment. It is the job of consultants and suppliers to propose applications solutions that fit the business problem not the job of prospective users to try to figure out how the acronymic technology will do something for them.

So to make the case for PLM in AEC, we need to look at industry structure and business drivers.

The AEC market covers the design, building, operation and maintenance of infrastructure assets. Just as it is larger discrete manufacturing users who are the PLM pioneers, we expect that it will be large scale engineering projects such as office blocks, sports stadia, new highways, utility networks rather than residential developments who will adopt PLM in AEC.

The industrial structure differs from discrete manufacturing industry:

- There are service providers who design and build infrastructure projects for owner operators to use. Many projects have sufficient impact on the environment to generate public interest in the project.
- The key production unit is a single project rather than a series production of products.
- Several companies come together on a more or less equal basis to contribute to each project rather than an Original Equipment Manufacturer (OEM) like Ford organising the whole industry chain. Ironically, some discrete manufacturers have similar ambitions to create "instant consortia" to avoid owning manufacturing or design assets that are not core to their business.

- Within the service providers there are many different disciplines involved: architecture; civil engineering; structural engineering; construction economists; electrical engineering; heating and ventilation engineering; etc.
- The owner operators such as transportation agencies, property developers, utilities and the government who will use the facility in its life are quite varied and their optimum use of the facility will be equally varied.

Large infrastructure projects therefore typically involve a number of "stakeholders" – groups with an interest and involvement with the design data. The handover from the service providers who design and build the project to the owner who will operate and manage the structure is analogous to the sale of a discrete manufacturer's product to its final user. Just as in discrete manufacturing the design locks in the cost of the product and project, the cost of owning and operating the structure is locked in by the design. Infrastructure lasts for a long time. It will be reworked and renovated several times. These costs dominate the total lifecycle cost. The final user tends to have more interest in the design data than a typical product user. They have operational cost savings that are not addressed by other enterprise applications. This might mean more – and longer-term interest – in design information and a better justification for PLM in AEC.

The AEC world is changing fast, generating new business drivers for AEC companies to respond to:

- There is a trend away from public to joint public and private financing of infrastructure. The emphasis changes from optimising the first cost to optimising the lifecycle cost. This introduces the need for more efficiency in design and operation of the project with even more accurate monitoring and control.
- Utilities and telecommunications companies, some of the biggest infrastructure owner operators, are going through unprecedented change. After all the mergers, acquisitions, disposals and business failures we will still be served by price regulated monopoly elements of these businesses. In the last analysis they have the need to compete by working assets harder.
- The world-wide environmental lobby is having an increasing impact. Approval is more difficult to obtain and more of the community is active in reviewing and monitoring infrastructure projects.
- By definition, construction is a local business. However, major infrastructure projects use international consortia to develop the intellectual property as the norm. Now this is extending to design re-use and the off-site assembly of sub-units.
- A lot of time is wasted on a construction site as events destroy the production plan made at the beginning of the day. The advent of cell phones and PDAs capable of receiving data means we can now re-plan reach and inform individuals all over the construction site how to deal with exceptions.

Our conclusion is that there is a big opportunity for PLM in AEC. However, the AEC lifecycle is different, the stakeholders are different, the drivers are mostly different. The applications and the economic justification for paying for design data are therefore going to be different. We see the need to differentiate between PLM for discrete manufacturing and PLM for AEC. Since P could

be project or product we have invented a new acronym (sorry folks): Infrastructure Lifecycle Management, or ILM. The extra bad news is that we've begun to look at Consumer Packaged Goods industries, like Food and Drink, and process industries, like steel and textiles. They too are different! Please email me with your suggested acronyms!

The compelling case for the AEC industry is for users to look at their own business needs and identify where the applications can make a difference. In the long run, ILM and PLM will probably share the same infrastructure tools. However, today we recommend looking for tactical projects with short term pay backs.