

Why product lifecycle management should be on every executive's agenda!

Turning PLM into a business success

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"Good PLM capabilities are essential to accelerate the maturity growth in product development projects. This improves product design and cuts lead time and cost. A key capability is to build and apply virtual testing to get an optimal balance between physical and virtual testing. This can frontload product development and provide rapid learning loops to cross-functional teams."

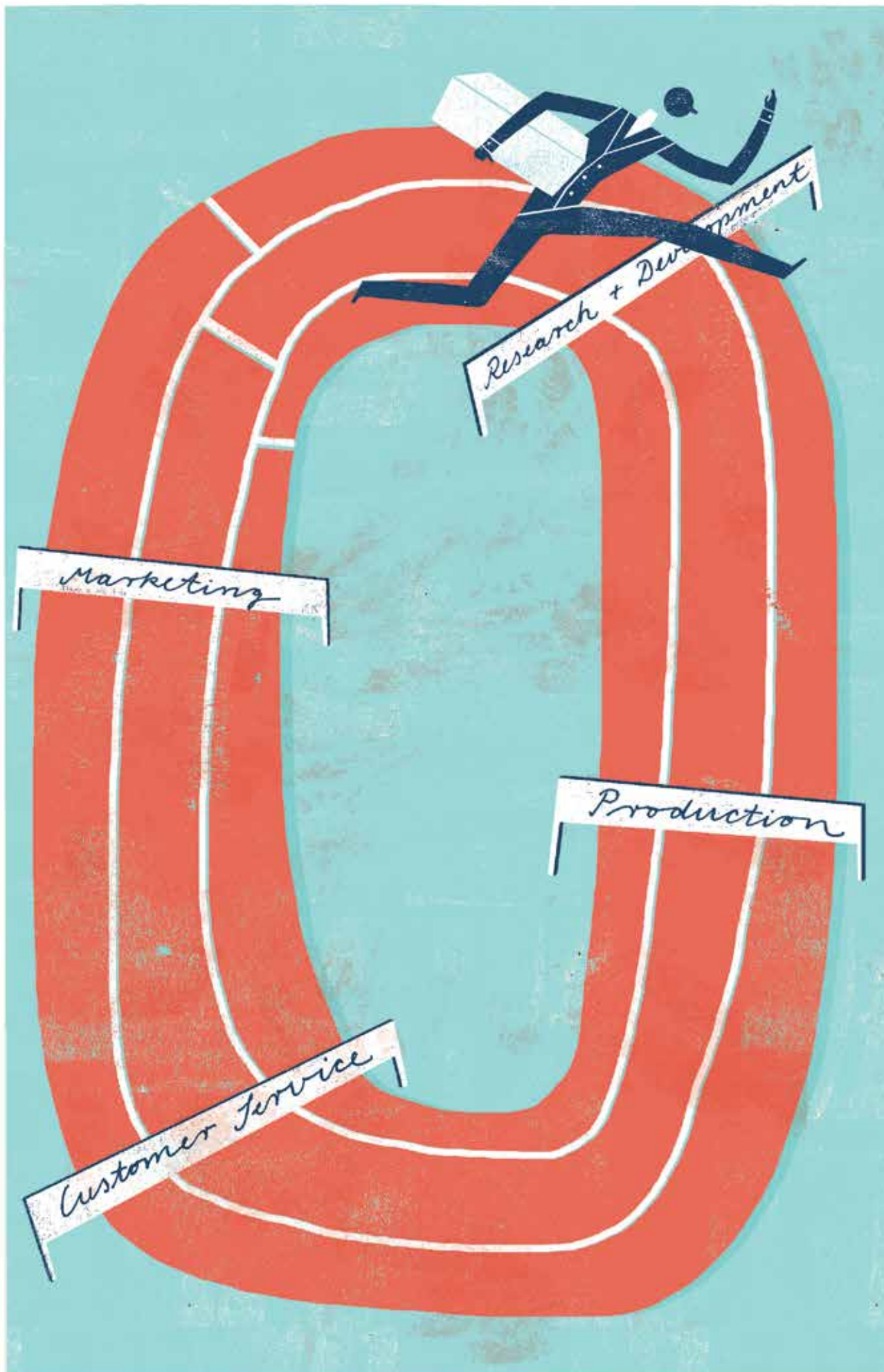
Mr Olaf Tellefsen, Vice President R&D Efficiency, Volvo Group

In industry, PLM is the process of managing the product and the product data during the entire lifecycle – from the concept, through design and manufacturing, to service and disposal. PLM integrates people, data, processes and business systems and provides a product information backbone for companies and their extended enterprise.

In their effort to improve PLM capabilities, executives often invest large amounts of money in modern PLM software with the promise of significant returns. Arthur D. Little's experience is, however, that most PLM initiatives fail. This is not due to a lack of capabilities in the software but is rather an effect of how the PLM projects are scoped and implemented. The consequences are not inconsequential, often leading to the loss of tens of millions of euros in sunk cost and resulting in the termination of staff and serious effects on critical business processes.

For more than a decade, Arthur D. Little has supported leading companies with the development of their PLM capabilities. In this article, we will give you insights on how to address the true potential of a PLM investment and avoid common pitfalls. We start by providing an overview of the subject and subsequently present

Product lifecycle management (PLM) initiatives often miss their true potential and make projects unnecessarily costly. Not understanding how to optimize these investments can have long-term effects on both the top and bottom line, while companies that realize how to use PLM as a competitive weapon can capture significant market advantages. In this article we give you insights into how to take an approach that addresses the true potential of a PLM investment.



three case studies of companies that confronted their difficulties and turned their PLM investments into business successes:

- 1) Company A, which originally did not think of PLM as a strategic business approach but as another IT investment
- 2) Company B, which did not see PLM as a post-merger enabler, initially preventing it from realizing expected synergies
- 3) Company C, which did not fully utilize the cross-functional benefits of PLM.

Why the full business potential of PLM is not realized

In order to understand companies' current approach to PLM it helps to understand the historical evolution that has taken place. Products and product families have become more complex, with increasing amounts of electrical and embedded software components, which has gradually created a demand for structured product data management. This demand had its original source in the product development function that engineers needed to support the design phase of the products. Today the need for product data has become a reality across the entire enterprise as vast amounts of data are created, managed, and utilized across functions.

To manage the large amount of product data, companies often try on a best-effort basis to implement various IT applications in the hope of at least improving their engineering efficiency (see Table 1). Significant investments are made and what was originally a business challenge is generally reduced to a functional engineering efficiency and IT application discussion. This skewed view and simplification of PLM is not uncommon and is one of the reasons PLM programs so often result in investments that fail to meet business requirements. Arthur D. Little research shows that 70 % of PLM investments fail to meet management's expectations. Interestingly, companies that are successful with their PLM investments find the lion's share of the benefits in improving product efficiency (see Table 1).

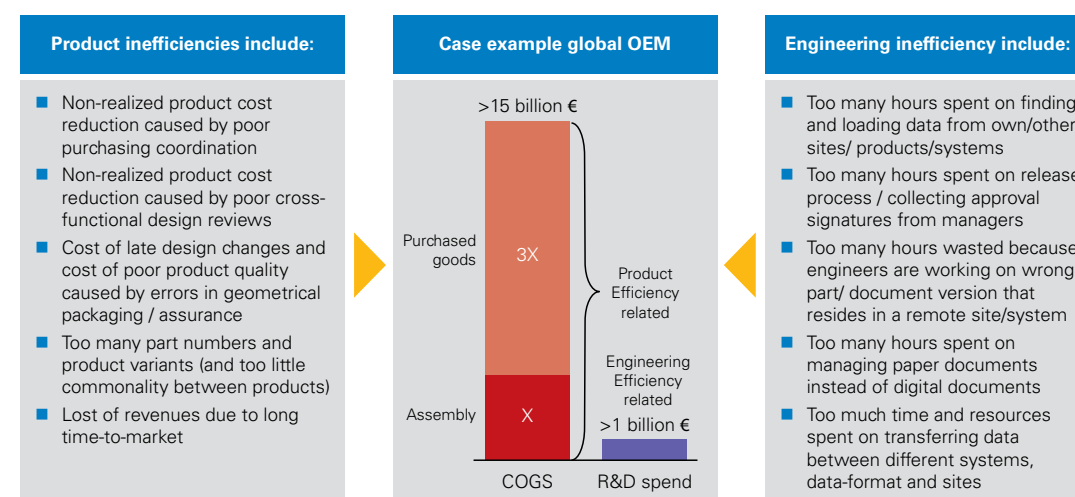


Table 1 The untapped potential from best-practice PLM

Source: Arthur D. Little analysis

Instead of reducing PLM to an engineering tool associated with a large investment, Arthur D. Little defines PLM as a business approach for managing the product and its related product data during its entire lifecycle. This approach to PLM is a prerequisite for companies to enhance cross-functional collaboration and successfully open up innovation, as well as to capture synergies from product-driven acquisitions. This business approach can unleash significant benefits affecting both your company's top and bottom line.

Addressing the true business potential of PLM

As companies often justify PLM investments through the quantification of increased engineering efficiency within a specific function, two challenges become unavoidable. Firstly, realizing engineering efficiency in cash requires that you actually dismiss the same amount of resources that you expect to gain in the business case, which is seldom done and the benefit is hence rarely realized. Secondly, the potential within the engineering efficiency dimension (e.g. R&D staff-time spend) is significantly lower compared to the potential in the product efficiency dimension (e.g. COGS). In a recent project performed at an assembled goods OEM, we found approximately three times more business value from product efficiency than from engineering efficiency. The prod-

uct efficiency gains were also easier to realize, setting expectations correctly and strengthening the business case. At another company we found that if engineers were unable to find an existing component after searching for it for a maximum of three minutes, they would create a new article. This was one of the root causes behind severe part duplication and consequently poor commonality and high product costs. Unfortunately, many companies fail to see the relation between product efficiency and PLM and hence miss the opportunity to capture the main benefit of their PLM investments.

“PLM is not an IT investment. PLM is the transformation of product development. Before beginning a PLM project, top management needs to identify the benefits and value necessary to push its company to a new competitive level. Selecting the right partner with in-depth business knowledge and competitive technology will ensure that the company achieves these goals, while allowing for the right scope and scale.”

Mr Brian Shepherd, Executive Vice President PLM & SCM at PTC

Another key capability required by adept PLM practices is risk avoidance. Take the example of a company not in control of its product data during the product’s lifecycle. If, hypothetically, when customers use the products people are injured, the inevitable inspection by a regulatory body would probably end with the following kind of demand:

“Please supply us with the design history file during the product’s lifecycle, including the detailed log of test approval for this individual assembled product as well as each individual part. This information, combined with root cause analysis, risk/consequence assessment and mitigation plan for this product release, needs to be supplied to the competent authority within 10 calendar days.”

Product efficiency and regulatory compliance are already on top of the agenda for most CEOs in modern global companies, but PLM needs to be seen as a key enabler as companies seek to exploit and realize this untapped business potential at a reasonable level of risk.

Company A: We did not think of PLM as a strategic business approach but rather as another IT project

Not appreciating PLM as a strategic business approach, or having CxOs who are unwilling to understand PLM, can have devastating implications. This case study is an example from a division of a global company whose management decided to close down its PLM program despite investments of tens of millions of euros.

What went wrong?

The implementation project was run as an IT project rather than as an initiative to improve the company’s business approach. Not only did this result in an inappropriate project management setup but, perhaps worse, the company had no clear idea of what the value of the PLM initiative was. This is a common problem. Most companies tend to put too little effort into building their PLM strategy and determining the business benefits before embarking on the implementation phase, as illustrated in Table 2.

Since the division had jumped into a solution, a large number of undesirable customizations had to be made and the implementation effort soon focused on the wrong things – solving and discussing problems rather than focusing on achieving business benefits. Not until it was too late did management understand that the chosen PLM software and vendor was not appropriate to support their required business needs. The vendor had historically made several successful implementations using the system, but the division failed to assess whether or not the system would actually support its specific needs.

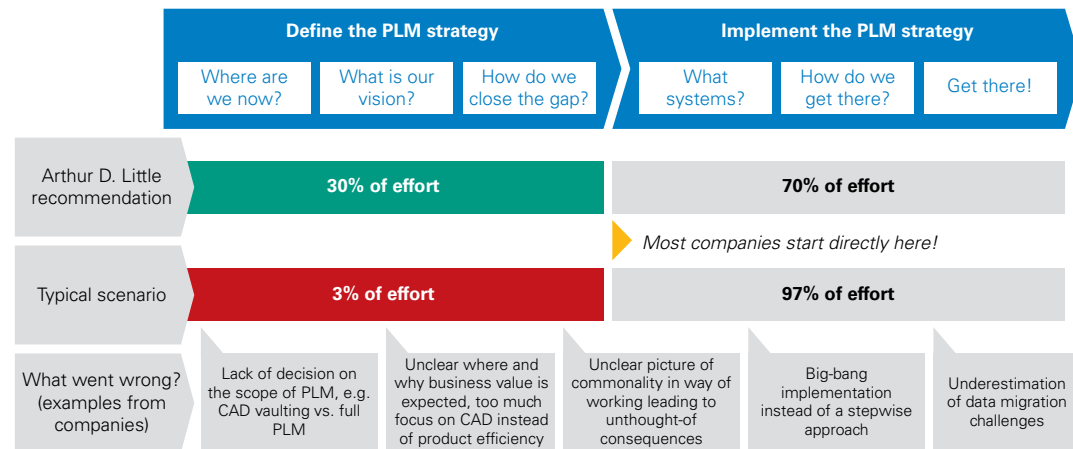


Table 2 Arthur D. Little's PLM approach

Source: Arthur D. Little analysis

Actions that turned the PLM investment into a business success

The decision to shut down the project was right, and the division learned its lessons and restarted the PLM program. Today it works much more strategically with PLM in order to focus on improving its business processes. It has a clear PLM strategy and is well aware of the implications that its decisions will have in the future. It uses advanced valuation and scenario models to assess the quantitative business impact of different decisions made at different points in time. Additionally, it has a dedicated PLM office as well as an empowered CIO who fully understands both business and IT issues. It has been a long step-wise journey to get to where it is, but today the company is considered one of the most PLM-mature within its industry.

Company B: We did not see our PLM as a post-merger enabler, which initially prevented us from realizing expected synergies

A world-leading medtech company had struggled for years to capitalize on synergies in R&D, purchasing and manufacturing from its acquisitions. It was obvious that the company had a sub-optimal PLM environment, with poor ability to manage products and

product data over the lifecycle in an efficient and secure way. The company was often late with product launches and experienced severe cost and quality problems across its portfolio. Poor control of product data also exposed it to unnecessary regulatory risks.

What went wrong?

The company had started off from a typical and often devastating point of departure (see Table 2). The PLM program was run as multiple IT projects in isolation (one per site). Management had selected and implemented a PLM system that was incompatible across the different sites. As a result, the projects were not realizing the desired synergies but rather were reinforcing processes, governance and IT at each site, preventing the executive integration strategy.

Actions that turned the PLM investment into a business success

The project was stopped and the company decided to start from scratch, placing significant effort on front-loading and scoping the program. A PLM strategy was developed that defined the necessary business requirements (objectives, targets and KPIs) to capture the main benefits of the integration. These requirements were broken down to guide and evaluate PLM installation options (illustrated in Table 3).

Corporate objective	Issues As-Is	Root cause	Possible To-Be situations	
			Objective supported by one global PLM system	Objective supported by multiple local PLM systems
Reduced product cost / maximize part commonality	Different sites approach the same suppliers separately with quotation for the same article	Not possible to reuse parts between sites due to lack of global search capability, global standard components database etc.	✓	✗
Reduced cost of quality	Errors from engineers work on "faulty" data and crossfunctional	Product data is stored, managed and viewed in	✓	✗

Table 3 Business requirements on PLM system options

Source: Arthur D. Little analysis

The total annual business value from the PLM program was more than 15 million euros. A large portion of the value arose from increased part commonality and lowered product cost captured through tighter collaboration between acquired units. The revised PLM implementation road map was reversed and set up as a business program with an IT component instead of the other way around. The road map had a clear convergence plan for the PLM system built around one common installation. It highlighted what product data needed to be managed over the lifecycle to capture desired synergies, and where it needed to be stored and managed. Additionally, the company had a plan to improve regulatory control through a common engineering change process and tighter product governance.

Company C: We did not fully utilize the cross-functional benefits of PLM

A leading global company that develops and sells products for consumers and professionals had grown aggressively through M&A. This had led to a fragmented IS/IT and left its PLM landscape a patchwork of locally tailored solutions (more than eight different systems were in use to manage product data), as well as a scattered R&D organization working in more than 40 different places globally. The company wanted to increase global integration in order to tap synergies and continue growing organically. It realized that its fragmented approach for managing product data throughout the lifecycle did not support the new common product development processes or the CAD commonality it had just implemented.

Local PLM investment demands from the different global entities were very diverse, with each location wanting different applications in order to fulfill its own perceived needs. All PLM investments came to a halt and the CIO and the CTO did not know how to move forward, but realized that something fundamental was not being understood.

What went wrong?

The CIO and CTO did not see the root causes of the dilemma and nearly fell into a common trap:

Firstly, the company had an engineering-centric focus and had overlooked the holistic demands that a PLM strategy should meet. The focus was thus solely on the engineering function (“as designed”) and not on cross-functions, as illustrated by the solid red line in Table 4. This is a common issue, as too few CxOs address PLM as a company-wide strategic issue but rather as an engineering tool or archiving system for drawings/CAD.

Secondly, the sites had a local mindset despite the company’s global ambitions and thus missed out on the common corporate perspective (see Table 4). The local R&D managers were doing the right things from their perspectives as they improved their sites in-



dependently, but there was a lack of understanding of the company-wide implications, which led to a sub-optimized PLM set-up and, in this case, the inability to capture desired synergies.

Thirdly, the company had started by selecting a PLM application based on engineering needs before understanding the needs of the entire company. This is a very common mistake, which in a worst-case scenario can end up in large sunk costs when it is realized that the application does not deliver the desired features.

Actions that turned the PLM investment into a business success

The company called for support in order to understand the dilemma, review its actual needs and define a company-wide PLM strategy. Since the company’s PLM maturity was low, the first step was to create a common way of working to enable functional collaboration between global R&D sites and at the same time consider the future demands of increased cross-functionality. The most appropriate PLM system was selected after rigorous assessment of different vendors during which they had to prove that their applications could deliver the expected functionality.

Build the path to PLM business success

As demonstrated in the case studies above, the path to PLM business success is often long and costly. A PLM investment should not be considered as a short-term cash generator (although time to break-even is usually fairly short), but instead as a necessity for long-term excellence in both product and engineering efficiency. A PLM investment should be seen as a strategic business improvement and a key enabler to optimize business operations. Driving such business improvement initiatives without a well-functioning PLM system would be the same as driving a production efficiency program without a Material Requirements Planning System (MRP) – large benefits will simply not be achieved.

“PLM is often bundled as an ERP add-on. PLM and ERP are complementary, with equal amount of business value in each area, hence you need a dedicated (but integrated) strategy for each area.”

Mr Bob Whale, EMEA Centre of Excellence,
Siemens PLM Software

It is therefore not about “if we are going to do it” but rather about “when we are going to do it.” When your company feels mature enough to face the change challenge, we recommend using the following guidelines in order to build your path to PLM business success:

Secure CxO engagement and a strategic business approach to PLM

Ensure that top management understands the business challenges you want to address and the business benefits you expect. Provide a set of well-defined KPIs so that top management can track investment progress in order to create buy-in and earn continuous focus. Approach your investment from a strategic point of view, focusing on the business improvements you want to achieve rather than suggesting implementation of an IT solution.

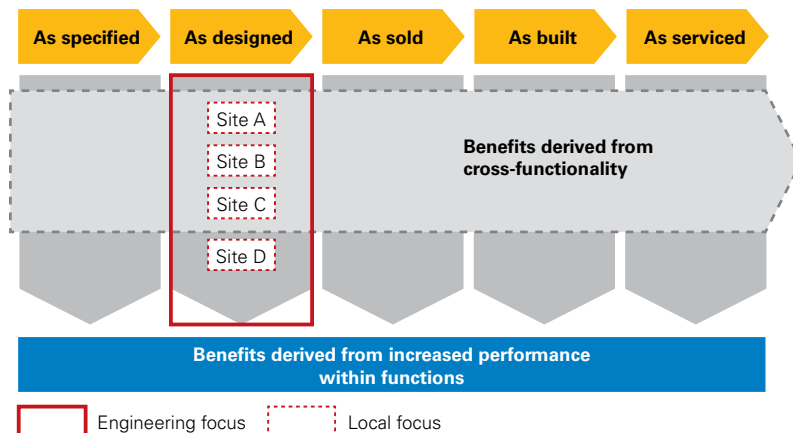


Table 4
Overly narrow PLM focus
Source: Arthur D. Little analysis

Refuse to start an IT implementation before expected business benefits have been detailed

Do not start your IT implementation before you have a clear PLM strategy (see Table 2). Secure a holistic product efficiency-centric PLM strategy that is aligned with the corporate strategic objectives. Detail your business benefits using transparent logic linked to a set of key activities that will drive value realization. Measure the improvement potential of your key PLM activities and estimate how the resulting solution will improve these. Create a detailed requirements specification for your resulting solution and perform a thorough vendor due diligence to ensure that the chosen IT-solution approach can deliver the expected improvement potential (without endless customizations).

Do not take an engineering-focused approach to PLM, but a holistic approach

Look beyond the engineering function in defining and designing your PLM solution, as significant value is often captured by working across functions. Examples of cross-functional benefit areas are reduced cost of manufacturing, increased part volumes through commonality (involve purchasing), and improved after-sales support (correct part or part version to the correct customer, short response time etc.).

Insights for the executive

The concept of product lifecycle management is not fully understood by executives and PLM initiatives are often misguided, missing their true potential and making projects unnecessarily costly. Not understanding how to optimize PLM investments (e.g. by focusing on engineering efficiency instead of product efficiency) will have long-term effects on both the top and bottom line. At the same time, companies that realize how to use PLM as a competitive weapon will be able to capture significant market advantages. It is crucial to articulate a PLM strategy considering long-term corporate strategic objectives before initiating any project or application investment. The approach must be holistic, considering the entire enterprise to avoid sub-optimizations in decision-making.

Arthur D. Little has identified three basic yet critical guidelines to ensure that you maximize your chances of generating a high return on your PLM investment and turn it into a success:

- 1) Secure CxO engagement and a strategic business approach to PLM
- 2) Refuse to start an IT implementation before the expected business benefits have been detailed
- 3) Do not take an engineering-focused approach to PLM, but a holistic approach.

Following these guidelines will help to generate high returns on PLM investments as well as building sustainable competitive advantage over time. However, failing with PLM investments will jeopardize the top and bottom-line positions of even the strongest company.

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