

# PLM FRUSTRATIONS

WHY DO MANY PLM PROJECTS FAIL?



aras

The product lifecycle management (PLM) world is divided into two categories: The frustrated PLM veterans who have tried and failed to implement a successful PLM system, and the PLM novices who are blind to the frustrations that lie ahead. This is because traditional PLM systems often do not achieve what they promised. The answer is a transparent, flexible, and resilient PLM solution that actually works.

**P**roduct lifecycle management is capable of revolutionizing product development and industrial manufacturing. Its beginnings lie in product data management (PDM), where the computer aided design programs of the 1980's transformed the product design process into a digital collection of product data. Due to the amassing of large amounts of product information, the need for the management of this data arose – the birth of PDM systems. In the 1990s, documents were linked together based on ISO 9001 standards and regulatory and product liability requirements, enabling a simple change management process to be created.

From here, product lifecycle management (PLM) was established to extend PDM from the department level and into the enterprise. The management of product data grew to include the entire product lifecycle, from design and development through to manufacturing and service. Instead of confining product information to departmental data silos, PLM is meant to provide mechanical, electrical, and software engineers with a unified platform for collaborating on the development of complex product systems. If implemented correctly, information can be shared seamlessly, not only with in-house development teams, but with the extended supply chain as well.

The promise of such a system is tempting. It has the potential to deliver more efficient product development with lower error rates, better use of resources and project budgets, less waste in production, and faster time to market. The culmination of successful PLM, enabling faster product design, development, manufacturing, and service.

## The Frustrations of Traditional PLM

However, the reality is that many PLM projects do not deliver on this promise. Seamless integration across the enterprise and in the supply chain, large cost savings and more efficient processes – all gained after a brief customization period – remain a wish. Instead, many projects remain stuck at the departmental level and do not progress farther in their implementation. Customizations to the system are cumbersome so that the desired functionality can only be achieved slowly and with high costs – if at all.

These traditional PLM projects can be characterized by the formula 10-10-100: Ten percent of the desired functionality is achieved, ten percent of the expected users are connected to the system, but 100 percent of the planned budget is consumed.

For the reputation of PLM, this reality is devastating. Subsequently, many businesses seek salvation in out-of-the box solutions. However, this creates an additional problem: PLM projects are highly individual by nature, and because the structure of a company and its products differ, out-of-the-box systems are unable to meet varying PLM requirements. While easier to roll out, lack of customizable solutions result in inefficient processes. Additionally, as business processes evolve to meet changing market requirements, the out-of-the box system cannot be adapted.

At this point, a company is stuck. Conventional business models force the lion's share of the budget to be spent at the beginning of the project, for data manipulation, process retrofitting, and cumbersome implementations. The result is a minimally functional PLM system, and an exhausted project budget.

## How Did We Get Here?

The frustrating state of affairs in the PLM industry is no coincidence. The causes lie not only in the high cost of conventional PLM projects, but also in the history of the major PLM vendors and the resulting rigid technology of their systems.

A look at the big players in the industry shows the respective companies and the evolution of their systems are similar. For starters, the major vendors began as providers of CAD, CAM, or CAE tools, and their product management systems grew incrementally over time, first to encompass PDM capabilities, and later, PLM.

Another commonality emerges here: Instead of solutions based entirely on in-house code, most of these PLM systems developed from a compilation of independent products, forced together through company mergers and acquisitions. The result is a fragmented, piecemeal PLM system that does not always interact well with itself. Some components may be well integrated because they were developed in-house or have been substantially reworked, while others are at different stages of integration and may not work well with the overall system.

PLM veterans will recognize the signs of this when they have, for example, been unable to create a single, comprehensive bill of materials (BOMs) that spans multiple disciplines, or when the change management process ends midway through and requires that additional steps be carried out in a different ERP system. Pieces of the software may work well together, but other functionalities are nearly impossible to implement because the system is not capable of communicating well with itself.

### **Customization and Upgrade Headaches**

Another hallmark of traditional PLM systems is their inability to be easily customized and upgraded to meet changing market conditions and individual business needs. This is because virtually all conventional PLM solutions rely on compiled code-based architectures, where the business logic and data models are defined in the source code. In order to customize or add new features, extensive reprogramming of the source code is needed. The source code must be rewritten or amended and then recompiled so that links between items are rebuilt. The new version of the software must then be redistributed to all instances of the connected items.

Not only does this require a detailed knowledge of the source code and of the respective programming languages (which can differ between products), but the process is error-prone and can take months to complete. Additionally, due to the propriety nature of the code, it is enormously expensive and requires that external, vender-approved consultants be involved.

This architecture is also what makes upgrading difficult: New versions of the software result in changes to the underlying code. Therefore, customizations must be transferred again and hard-coded into the new system. In the worst case, the new version has moved so far from the instance used by the customer that the customizations must be redeveloped from scratch. Under certain circumstances, this can cause the entire PLM project to fall so far behind that many previous investments are lost. In any case, upgrades are the sole responsibility of the customer – a fact that major PLM vendors are quick to point out.

This puts companies in a bind. They either wait as long as possible to upgrade, resulting in lost opportunities to take advantage of capabilities added in the latest release, or they upgrade, which is always a lengthy and enormously expensive process, the benefits of which are hard to calculate. It is important to emphasize here that if an important feature is no longer supported in the new release, many companies often stick with outdated versions, no matter the cost – both the literal financial cost and the cost of missing out on improvements to the PLM system.

In addition, the proprietary nature of the software ensures that a company is bound to the vendor, since only the manufacturer has access to the source code. Therefore, the software provider or a licensed consultant is the only one able to make changes or adjustments.

For many PLM projects, these barriers mean that companies remain stuck far below the objectives originally set. CAD management is still the starting point of many PLM projects and is therefore the first capability added to the system. The installation and customizations needed to get these few capabilities implemented can often require the entire project budget and consequently, no money remains to provide additional users with licenses. Instead of the hoped-for, fully integrated PLM system, companies end up with an expensive PDM solution accessible only to the engineering department.

## Changing the Reputation of PLM

How can the obstacles to successful PLM implementation be avoided to ensure that your PLM solution meets its potential and delivers on its original promise? It is clear that the barriers cannot be eliminated with individual features or superficial changes. Instead, the technology behind such a PLM solution must be fundamentally different than traditional systems.

One way to be successful is to break from the conventional way of anchoring the object model and business logic in the source code and instead separate the two. Aras Innovator® is just such a PLM solution that was engineered from the start up to be different than the status quo.

The basis of the Aras® software is a service-oriented architecture (SOA) platform that provides different, related services such as lifecycles, workflows, and permissions. These services are accessed by different application areas such as requirements management, quality management, and document management, which are stored in the form of normalized data structures in the database. When changes or new features are made to any of these services, they are implemented at the platform level, without changing the source code of the applications. The benefit of this is that no matter the number of customizations, the software's core technology remains upgradeable without affecting the applications.

The Aras platform is based on open standards and internet protocols, which ensure transparency and security. The system can be seamlessly integrated into other, existing software environments, and the code can be viewed at any time without proprietary tools or knowledge. Thus, the user is independent of a particular provider or their consultants.

The advantages to such a PLM platform are enormous. Solutions and business models can be updated in real-time on a browser-based client using drag-and-drop operations. Extensive programing and compiling for every little change is a thing of the past. In the case of version upgrades, since changes are made only on the platform, the application level is largely unaffected, and therefore there is little downtime.

Additionally, Aras performs all version upgrades for customers on subscription at no extra cost, including the migration of all customizations.

## A Unique Business Model

Even the business model of Aras breaks with common conventions. The core PLM capabilities of the Aras Innovator solution are open-access, and additional capabilities can be added via a subscription model. With traditional PLM systems, there is a high initial licensing cost followed by unpredictable and ongoing costs for support, maintenance, and upgrades. This places a huge burden of risk on companies using traditional PLM systems, even before the success of the system can be known. With Aras, however, the software can be downloaded and tested prior to purchasing a subscription.

The benefits of this are twofold. Not only does the Aras business model allow companies to invest in a PLM solution over time and with less risk, but it also means that Aras is held accountable for the success of its customer's implementations. The subscription model ensures that Aras is committed to providing powerful and robust solutions, while also developing long-term relationships with its customers.

Another reason for the high level of satisfaction of Aras users is that customers are not required to choose between their legacy PLM system or the Aras solution. If a traditional PDM/PLM system has been successful for certain processes, then the system can remain in place and can be fully integrated with the Aras platform or backbone. Therefore, initial investments remain secure and existing solutions can be expanded with much less effort than would be possible using the approach of traditional providers. This provides businesses with a choice: They can either choose to use Aras Innovator for all their PLM and PDM needs, or can combine the solution with other systems.

Finally, the scalability of Aras implementations are tried and tested. Aras has been proven with over one million named users and 250,000 concurrent users, making it a truly enterprise-wide solution.

## The Future of PLM

Although it is impossible to predict the direction technology will take in the future, businesses must be prepared for the rapid pace of new market trends. Smart, connected products have disrupted development with increasing dependence on embedded software and lifecycles that extend far beyond the manufacturing floor. Globalization has left businesses with new and emerging challenges in the form of expanding global suppliers and disparate design and manufacturing teams who must collaborate effectively from opposite sides of the globe.

No matter the future changes that technological innovations bring, companies must be able to efficiently manage enormous amounts of product data – the whole product configuration – through all phases of the product lifecycle including design, development, manufacturing and service. With customizable, upgradable PLM solutions, Aras Innovator is designed to power the business of engineering and is flexible enough to grow with the needs of rapidly evolving product lines. It is integrated to design tools and other corporate systems for the purpose of collecting, sharing, changing and managing information. With a true digital thread maintained across the entire lifecycle, Aras reduces cycle times, mitigates risks, lowers product costs and improves product acceptance. As companies undertake the production of complex product systems, Aras is set to ensure that product lifecycle management remains an asset powering your business and not a frustrating liability.

### About Aras

Aras enables the world's leading manufacturers of complex, connected products to transform their product lifecycle processes and gain a competitive edge. Aras' open, flexible, scalable, and upgradeable PLM platform and applications connect users in all disciplines and functions to critical product information and processes across the extended enterprise. Aras customers include Airbus, BAE Systems, GE, GM, Hitachi, Honda, Kawasaki Heavy Industries, and Microsoft.

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