

Shipbuilding Catalyst: Accelerating PLM Value for the Shipbuilding Industry

CIMdata Commentary

Key takeaways:

- *Companies in shipbuilding and marine are not consistently achieving the maximum value from their PLM investments*
- *To maximize benefits, implementations need to be tailored for and incorporate industry specific best practices and company-specific business needs*
- *Companies need to fully implement the PLM technology they acquire to maximize the value from their investment—there is often a Value Gap between investment potential and return realized*
- *Siemens PLM Software's Shipbuilding Industry Catalyst enables more complete, industry tailored, best practice enabled implementations resulting in a higher return on investment that accrues more rapidly*

Shipbuilders and other players in the marine industry face a number of challenges as they work to adopt modern PLM strategies and solutions to enhance individual, group, and organizational productivity to allow more complex projects to be undertaken and delivered profitably. The “Future Fleet” initiatives that are currently driving design of the next generation of ships are resulting in more complex ships and marine structures being conceived to provide improved performance at much lower cost than past ships. This in turn demands new design and construction strategies that place greater stress on the people who have to design and build them. Some areas of particular concern include the increased complexity of ships, the increased speed of design and construction demanded by customers, complex construction strategies, tight budgets, longer in-service life spans, more complex configurations in multi-ship projects, a much more complex and difficult worldwide regulatory climate, and others.

Companies in the marine industry, like companies in other industries, invest in product lifecycle management (PLM) as a means to transform their product development and production strategies and environments, allowing them to create innovative products and services, and improve their overall competitive position. PLM solutions today are more far-reaching than in previous years—providing expanding capabilities in more complex implementations. The implementation of PLM is having a fundamental impact on the way leading shipyards design, produce and sustain the next generation of advanced ships by improving total enterprise productivity, reducing cycle times and lowering the total ownership cost of future fleets. One shipyard in Europe reports increased production rates for mega-yachts from one every two years to 2.5 every two years through its use of PLM. No matter which PLM solution provider a company uses to support their business transformation, the way in which they implement PLM technologies, processes, and solutions has a major impact on the overall value they realize from their investments. Maximizing their PLM return on investment (ROI) and realizing that ROI early is critical to business success. The Siemens Shipbuilding Catalyst enables shipyards to shorten their time to value and boost their return on investment with this transformational technology.

PLM Value Gap

CIMdata research has identified a substantial gap in the value that PLM implementations using similar technologies delivered to different companies, even in the same industry. This research has revealed a widening gap between PLM technologies' potential capabilities and what actually gets implemented—and therefore the value achieved. This gap reduces the rate at which a company receives a return or positive impact on their PLM investment. The following figure illustrates the gap that exists between the investments companies make in PLM technologies and the value they receive from the implementations that they deploy. We believe that this value gap is larger for companies in the marine industry than for other industries due to the slower adoption of PLM in shipbuilding and marine.

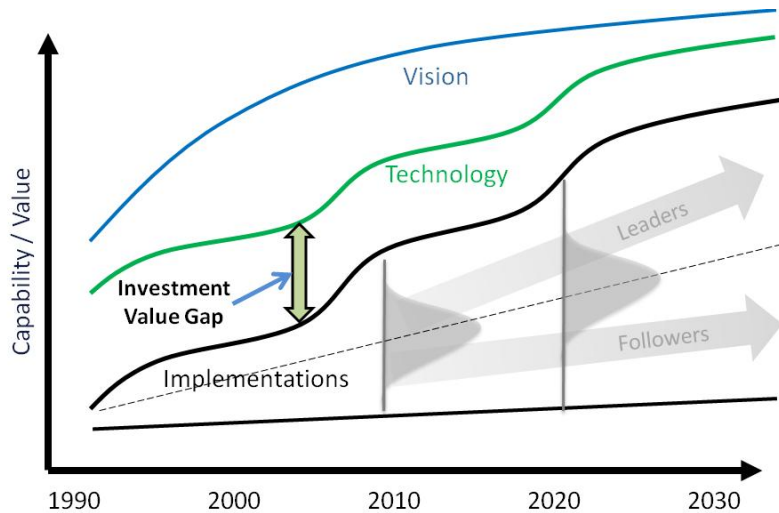


Figure 1—The Value Gap in PLM Implementations

The Value Gap shown in Figure 1 exists for several reasons:

- It takes time, resources, and money to tailor a typical PLM solution to best support a company in the marine industry
- Having to tailor (or in some cases customize) the PLM solutions results in companies not being able to take full advantage of the technology and solutions they have acquired
- Improperly tailored marine solutions require additional cultural changes, user training, and operational changes to take full advantage of new solutions and technology
- It is difficult to take advantage of new releases (e.g., new technology and expanded functionality) if marine companies do major customizations when they implement their selected solutions

Due to the complexities faced by companies in the marine industry, these issues become major constraints to effectively implementing a PLM solution strategy. This decreases the level of benefits and return on investment a company can achieve from PLM.

CIMdata's research also shows that the Value Gap is wider for PLM implementation followers when compared to leaders. Followers consistently receive less value from the time and money they invest in PLM. As leaders continue to get more from their PLM investments, the gap in investment value or business performance will continue to increase.

Leader companies plan their PLM investments and establish an implementation roadmap to meet their needs both for technology and solution acquisition as well as the breadth and depth of deployment. They then more fully implement the PLM technologies they buy and update their business processes to better incorporate industry best practices that the new solutions enable. They also update their implementation as new functionality and technologies are introduced and they expand the use of PLM across their extended enterprise—in other words, they invest and keep up to date.

Followers often focus on automating their current environment and processes, and not creating and adopting more effective and efficient processes (i.e., their “To-Be” state is often just an automated form of their “As-Is” state). They tend to implement only selected capabilities of the acquired solutions both in functionality and scope and do not take full advantage of industry best practices. Customizing the solution to support their old way of working makes it harder to upgrade to new releases.

To narrow the Value Gap, companies need PLM technology and solutions that can help them better plan their implementations, incorporate industry best practices and processes, provide tools and capabilities to help them implement faster, and minimize upgrade time and associated costs. One example of how PLM solution providers are addressing these needs is Siemens PLM Software’s Marine Industry Catalyst.

What is the Shipbuilding Industry Catalyst?

Siemens PLM Software (Siemens) has created its Shipbuilding Industry Catalyst to accelerate customers’ deployments and solution productivity via a set of Marine configured components and best practice guides. The Shipbuilding Catalyst is intended to help a company achieve faster adoption of new and innovative PLM technologies and processes to reach their desired To-Be state and obtain a higher return on their PLM investment both in the short and long term.

The Shipbuilding Catalyst includes:

- A **Business Processes and Practices Guide** that is a reference for PLM across the entire marine product lifecycle and provides guidance on how PLM can best be deployed to impact that lifecycle
- A **Deployment Accelerator** that includes all of the necessary and recommended product selections, recommended configuration procedures, and specific best practices and training to ensure an effective PLM deployment for marine companies
- **Configuration Components** tailored to the marine industry to help implementation teams control the behavior and appearance of the PLM implementation, ensure proper adherence to the desired business processes, and provide the foundation for faster, easier upgrades
- **Program and Project Management** tools and processes packaged for shipbuilding and marine including embedded templates that accelerate ship delivery and facilitate the use of best practices reduce risk and mitigate program delays
- **Configuration Management** capabilities specifically intended to help product developers and others navigate complex product structures containing millions

of elements efficiently and quickly and to track configurations of ship-borne systems throughout the lifecycle including operation

- **Ship Design and Engineering** takes advantage of 4GD Design and Engineering Process to accelerate development of ships and offshore structures, driving innovation and facilitating global collaboration, managing 3D models in context of key work groups, such as major ship modules, compartments, systems and locations.
- **Digital Ship Production** tools to help plan activities in the construction yard helps digitally simulate complete ship assemblies and their associated processes to optimize the use of construction facilities, implement lean practices from the beginning of new programs, and avoid the cost of building expensive physical models across the entire shipbuilding lifecycle
- **Supply Chain Management** processes tailored for the marine industry including support for multi-CAD design content and supplier data exchange, it helps shipbuilders exchange data reliably and synchronizes operations with both suppliers and partners by ensuring the right parts are available at the right time

CIMdata believes that Siemens' Shipbuilding Catalyst approach incorporates many of the elements that are needed to help companies making PLM investments narrow the Value Gap illustrated in Figure 1 and get more from their PLM investment.

Benefits of the Shipbuilding Industry Catalyst

The Shipbuilding Catalyst is intended to enable a company to implement a PLM solution suite that is tailored for their business. It provides built-in marine industry best practices and synergistic best practices from other industries applied to the marine industry. The catalyst also includes training guides and support services. Catalyst best practices, processes, and pre-configured components should help eliminate much of the customization that companies have been doing to their PLM environments to support shipbuilding and marine activities. One of the major issues in implementing PLM is moving from a company's current way of operating to a new "To-Be" environment and methods of working. By incorporating industry best practices, the Marine Catalyst can help a company more easily define their tailored "To-Be" solution and deploy it more quickly and completely without application customization. The Marine Catalyst provides support across the organization and lifecycle (not just for product design). An example is providing change process acceleration—from the shipyard back to the design office.

The Shipbuilding Catalyst will also help implement the new 4GD Design and Engineering Process capability that is concurrently being introduced by Siemens PLM Software. The 4GD Design and Engineering Process provides organizations trying to cope with products that have very large numbers of design elements across the whole systems engineering gamut. Using typical technologies, it is difficult to initially define configuration structures, and then gather all of the design items into those configurations to support the work that has to be done. This is complicated by the facts that many different views of the same data are required by different roles throughout the product lifecycle (e.g., mechanical, electrical, procurement, production planning, support, etc.) and that people may want to view structures that were not preconceived (e.g., everything contained in a room or group of rooms, all pumps and valves in a machine with their mountings, or everything forward of a particular frame). Often these configurations can't reasonably be predefined without massive amounts of effort.

The 4GD Design and Engineering Process approaches the problem in a different way from traditional solutions. It essentially eliminates the need to create pre-defined structures for every view of data that will be desired by product developers and other product lifecycle participants. It treats every design item as a base object that can be configured on the fly by applying rules or filters in recipes, such as “find everything that is located from 20cm forward of ‘Frame A’ to 20cm aft of ‘Frame B’” or “find all components in the hydraulic system that are within 10 cm of the fuel system” or “find all parts match a set of specifically selected, user-defined criteria.” This allows users to see just what they want to see to do their work, in the context they wish, without having to have pre-configured the structure before searching and without being limited to a single organization of the product data. This technique allows product data qualified with options, variants, and effectivity to be defined and dynamically configured more flexibly than with pre-configured structures. It removes the burden from the product designers of defining complex structures, while allowing anyone to find data from across the entire product organized in the way they need it for their own tasks. The recipes developed by any user can be saved and replayed to facilitate future work.

By providing a set of configurable components designed to work with all parts of Siemens PLM Software’s Shipbuilding industry solutions (Teamcenter, NX, Tecnomatix, viewers, etc.), the Shipbuilding Catalyst helps leverage more of the technology more quickly, getting more value faster, and narrowing the Value Gap.

Another aspect of the Shipbuilding Catalyst is to help “future proof” a company’s PLM implementation. Once a solution suite is implemented using the Shipbuilding Catalyst, the company should be able to incorporate and adopt technology jumps, as shown in Figure 1, with significantly less time and cost.

Summary

The increasing complexity of ships and other marine structures, the increased speed of design and construction demanded by customers, tight budgets, longer in-service life spans, more complex configurations in multi-ship projects, a much more complex and difficult worldwide regulatory climate, and other factors continue to put high demands on companies to improve their product development environment to take more advantage of modern practices such as those offered by PLM.

Shipbuilders and other marine companies require solutions that are tailored for the special needs of the marine industry that they can implement quickly so that their investment in PLM can help them achieve and maintain a competitive position. The value is delivered by the full Siemens PLM Software shipbuilding solution suite (not only by the Shipbuilding Catalyst)—the catalyst helps you get to the value more easily and quickly.

CIMdata’s view is that 4GD Design and Engineering Process leading the way to solutions that can manage and present extremely large and complex product definition structures much more flexibly and faster than existing product structure management solutions.

CIMdata believes that Siemens’ Shipbuilding Catalyst can help narrow the Value Gap by decreasing the time it takes to configure and deploy a PLM solution for companies in the marine industry. Additionally the Shipbuilding Catalyst also allows companies to reduce or eliminate over configuration of their PLM solution so that it will be faster and less expensive to upgrade over time.

Companies that are looking to improve their ability to compete for the “Future Fleet” and to deploy and maintain marine focused, highly valuable PLM solutions should evaluate Siemens PLM Software’s Shipbuilding Catalyst.

About CIMdata

CIMdata, an independent worldwide firm, provides strategic management consulting to maximize an enterprise’s ability to design and deliver innovative products and services through the application of Product Lifecycle Management (PLM). CIMdata provides world-class knowledge, expertise, and best-practice methods on PLM. CIMdata also offers research, subscription services, publications, and education through international conferences. To learn more about CIMdata’s services, visit our website at <http://www.CIMdata.com> or contact CIMdata at: 3909 Research Park Drive, Ann Arbor, MI 48108, USA. Tel: +1 734.668.9922. Fax: +1 734.668.1957; or at Oogststraat 20, 6004 CV Weert, The Netherlands. Tel: +31 (0) 495.533.666.