BAE Systems Maritime's Supply Chain Journey with Eurostep

ShareAspace as the Collaboration System of Record

CIMdata Commentary

Key takeaways:

- *Supply chain collaboration for large product platforms is complex, and even more complex when defense security restrictions such as ITAR[1] and EAR[2] need to be adhered to.*
- *Eurostep's collaboration solution helps BAE Systems Maritime manage their ever-changing supply chain with data security while protecting IP and respecting ITAR controls.[3]*
- *The Eurostep solution's attention to data standards helps unite the data imports from BAE Systems' supply chain and satisfies the United Kingdom's Ministry of Defence's requirement for open access and long-term data retention.*

BAE Systems Maritime designs, manufactures, and maintains naval ships and submarines, as well as their state-of-the-art combat systems and equipment (Figure 1). These complex surface ships, submarines, torpedoes, radars, and command and control systems represent a challenge to commercial CAD and PLM solutions because of their size and complexity. Their design and manufacture also requires an extensive supply chain of components and subsystem providers.

Figure 1—Queen Elizabeth (QE) Class Aircraft Carrier
(Courtesy of BAE Systems Maritime)

The supply chain itself evolves as product development proceeds with some suppliers added for the design phase, then removed once the product enters manufacturing. As the product

[1] ITAR – International Traffic in Arms Regulations.
[2] EAR – Export Administration Regulations.
[3] Research for this commentary was partially supported by Eurostep.

moves into service, different suppliers again are added for operations and maintenance. The main actor in the service phase is the user organization, the Ministry of Defence (MOD), who need clear, correct, and valid information in order to sail safely. This means adding another large organization to the picture and that is the organization that governs the data during the many years of operations. Once the product platform was designed and manufactured, the MOD tasked BAE Systems Maritime with establishing a data repository and access methods that would be the basis for many years of operation and maintenance.

Integrating the different data sources and serving different organizations with the appropriate data was a significant challenge that BAE Systems Maritime was able to address across the enterprise. As the state-of-the-art platform is constantly evolving and the project duration is long, the management of engineering changes is key in order to manage cost, quality, and risk within the project. The requirements centered on the ability to provide the right information at the right time with security, mindful of IP, ITAR, and export controls. CIMdata has seen this same challenge in aerospace, automotive, and high value assets sectors. The security challenge applies between organizations as well as within organizations as data access is restricted to individuals in certain roles.

The need for a single view of product data was their next challenge. Regardless, if product data was distributed across different systems, users needed to have a view of the product as a single, unified whole, a system of records. BAE Systems Maritime also recognized that in addition to product data they needed access to business and performance data knowing that the majority of product cost occurred during in service support and operations.

All these requirements were overlaid by the United Kingdom's Ministry of Defence's condition that product data be based on standards supporting open access and long-term retention. Faced with these challenges, BAE Systems Maritime spoke with numerous companies who had the same complex list of requirements. Their solution was the tried and tested capabilities of Eurostep's ShareAspace used in maritime and defense but also other sectors such as automotive and heavy transportation.

Eurostep's ShareAspace

Eurostep's ShareAspace collaboration solution provides the necessary technology and capabilities to meet the challenges faced by BAE Systems Maritime. The ShareAspace solution is based on the information model of ISO 10303 (STEP AP242 and PLCS AP 239) and is capable of representing all the information required to cover the entire lifecycle of a complex product. As such ShareAspace's data model meets the requirements of the UK's Ministry of Defence for openness and long-term data retention. Product data is consolidated and mapped into ShareAspace from any solution provider's CAD, PLM, or other engineering systems to make it available to authorized partners. The solution's architecture facilitates change and business agility by making it easy to add and remove systems and partners without impact. It is available on-premise or cloud-based. CIMdata believes these ShareAspace technology aspects are in line with the future direction of many product manufacturing companies.

Different levels of change management can be applied to projects ranging from a simple informal approach to a more formal comprehensive change management process. ShareAspace Server provides an audit trail of the changes.

As BAE Systems Maritime moves forward engaged with Eurostep's ShareAspace they can direct their journey to a full Digital Twin definition of their product platforms (Figure 2).

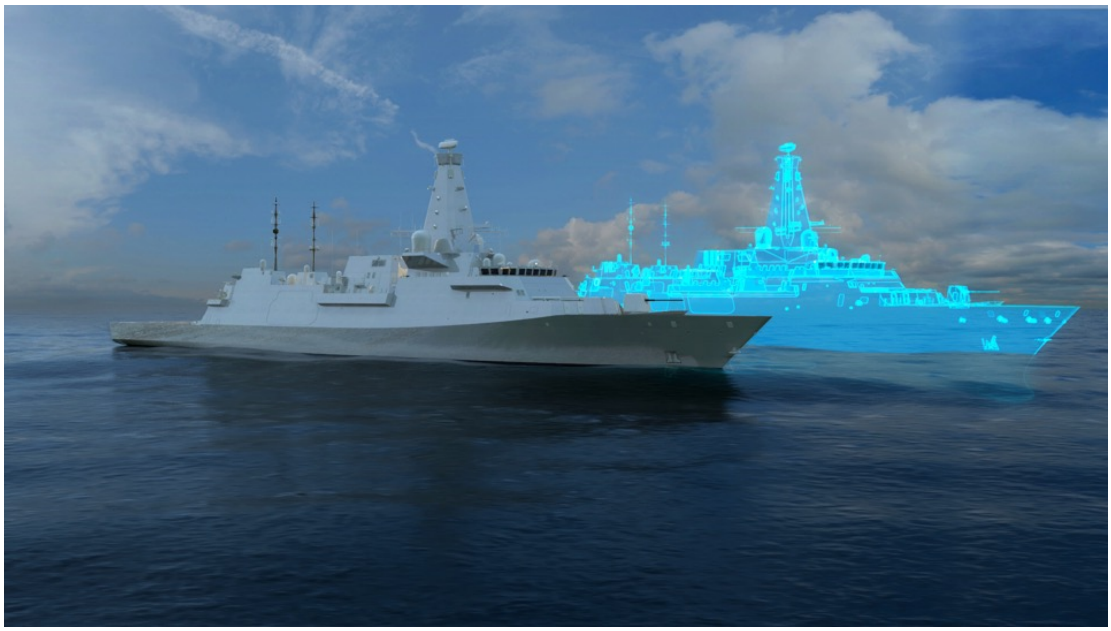

Figure 2—The Physical and Digital Twin of a Surface Ship
(Courtesy of BAE Systems Maritime)

A digital twin is a virtual representation that serves as the real-time digital counterpart of a physical object. By interacting with the Digital Twin, end users can enhance the limited information available in a file-based data source. A digital twin can be used for monitoring product performance and to support diagnostics of problems. Given that during their lifecycle, the majority of product cost occurs while it is in service, the digital twin can be tuned to optimize asset performance and availability. Clients of BAE Systems Maritime will benefit with lower service costs and improved readiness. Sensory data obtained from IIoT (Industrial Internet of Things) connections can be combined with historical data, human expertise, and simulation data to improve product reliability. Intelligent maintenance system platforms can use the digital twin to find the root cause of issues and improve productivity.

CIMdata believes that Eurostep's ShareAspace provides BAE Systems Maritime with the data repository based on standards and the enterprise collaboration capabilities they need to move forward on their journey to Digital Twin support for their highly advanced product platforms.

About CIMdata

CIMdata, an independent worldwide firm, provides strategic management consulting to maximize an enterprise's ability to design, deliver, and support innovative products and services through the identification and implementation of appropriate digital initiatives. Since its founding over thirty-five years ago, CIMdata has delivered world-class knowledge, expertise, and best-practice methods on a broad set of product lifecycle management (PLM) solutions and the digital transformation they enable. CIMdata also offers research, subscription services, publications, and education through certificate programs and 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.