BAE Systems Deployment of eQ Technologic's eQube®-MI

CIMdata Commentary

Key takeaways:

- *Fully successful PLM solution deployments must integrate with many other enterprise systems including CAD, ERP, Process Planning tools and even other PDM and PLM solutions*
- *eQ Technologic's advanced architecture supported BAE Systems' integration of a PLM solution to other enterprise systems*
- *eQ Technologic's eQube-MI Enterprise Service Bus integration infrastructure has proven to be reliable and scalable in production implementations over the past four years*

Background

In reality, an enterprise PLM solution implementation requires integration with Enterprise applications and legacy systems. No one vendor has a complete solution that meets all the product definition lifecycle requirements of a business. Many applications and systems are required to completely define and manage the product definition from concept through end of life. In a practical sense this means that product definition is spread across multiple data repositories, and a wide variety of software applications are required to modify and manage the product definition over its lifecycle. Applications range from authoring tools like CAD, document and data management tools including workflow, compliance capabilities, as well as manufacturing planning and execution systems.

For businesses to be efficient, information needs to flow across the applications that comprise the PLM solution suite in order to support business processes. To minimize errors in this flow, the best practice is to transfer data programmatically rather than manually. An additional benefit of programmatic transfer is that business logic can be incorporated to transform data into a more usable form.

Integrations are developed using two basic techniques; direct (point-to-point) integration or via an enterprise service bus. Direct integrations are typically implemented as tactical solutions to solve an immediate problem. Key issues with direct integrations include:

- Separate integrations must be developed for each pair of solutions to be connected
- Integrations must be updated when either of the solutions change
- The number of integrations grows exponentially with the number of solutions

A more elegant solution is to use an Enterprise Service Bus (ESB). From a technical perspective, each solution connects to the bus once, rather than to every other solution. Since the ESB is well defined, an application change will only require a change to its ESB interface. This reduces the cost of change and is more sustainable. More importantly, it enables the business to adapt to changing business requirements due to the ESB's flexibility in establishing and changing connections between solutions.

eQ Technologic's eQube

eQube, a platform for Enterprise Information Infrastructure establishes a digital backbone of integrated applications and provides enterprise-wide visibility leading to actionable insight and knowledge. eQ Technologic reports that this platform is flexible, robust, scalable, and secure with overall lower total cost of ownership.

eQube's ESB architecture allows for 'loose coupling' of source and destination systems. The business logic of an interface (for integration of source and destination systems) entirely resides within an eQube-MI process. Therefore, minimal or no coding is required in each application to create an interface. eQube-MI Business Process Modeler (BPM) allows interfaces to be represented by a BPM process that is able to handle complex data transformations using configurable business rules and hints. BPM's user interface is visual and intuitive with capabilities that help capture complex business rules. eQube's adapter framework allows application-specific connectors to connect to enterprise applications via their APIs and web-services. Any changes to the underlying application or the business logic are contained within the boundary of the eQube-MI process and do not impact the end applications. The end result of these capabilities is a robust, scalable, and secure solution with lower lifecycle costs.

Customers contacted by CIMdata report that eQ Technologic's products perform well and support their needs. BAE MAI Division recently published a report (see the following page) describing their PLM solution and how they use eQube-MI to support their integration requirements. At CIMdata we see eQube-MI as supporting industry best practices for integration and the BAE Systems report reinforces what CIMdata hears from other eQ Technologic clients.

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.

BAE Systems - Military Air & Information (MAI) Division:

BAE Systems' Military Air & Information (MAI) team use their expertise to design and build fixed wing military and training aircraft, as well as provide training, support and information services for customers worldwide, including the RAF.

MAI has expertise in the development, delivery and support of military air platforms, components and technologies through its products. MAI also provide defence information systems, networks and delivery platforms.

MAI has a large number of applications that create and consume product related data, which include the Siemens TeamCenter PLM product, together with a number of engineering and ERP applications.

In order to achieve a fully successful PLM deployment, MAI required a PLM solution that was fully integrated with numerous external systems, including CAD, Process Planning, ERP, etc. as illustrated in Figure 1. Approximately seventy-five transactions were designed to move data across all of these systems driven by various TeamCenter workflow or manual triggers. Having eQube-MI implemented on top of TeamCenter allowed MAI to leverage the TeamCenter security model within eQube-MI, which in-turn provided consistent data security without having to redefine the complete security model for each application. eQube-MI automatically checks and adheres to all security rules that are already defined in the TeamCenter security model - even to the point of knowing that the solution requesting data is only allowed access to specific data fields. MAI noted that eQube-MI's flexibility was a key factor that allowed the development of the interfaces in a short time period and at a relatively low cost.

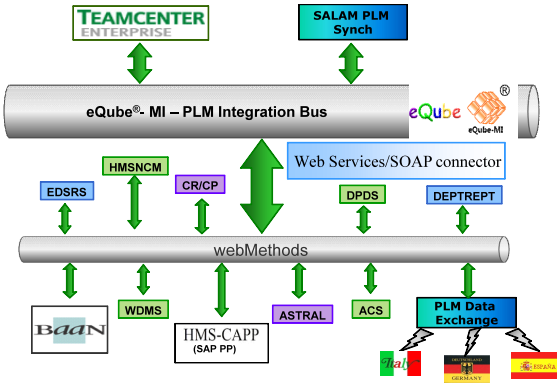

Figure 1 - Integration Architecture Using eQube-MI

(Courtesy of BAE Systems Military Air & Information)

Experience of eQube-MI in Production:

- Averages ~700 transactions per day.
- Peaks ~2500-3000 transactions per day.
- Bulk load of 5000+ transactions was handled without issue.
- Transaction failures have been recoverable.
- Interface failures mainly due to :
  - User inexperience with using TeamCenter
  - Data quality related issues (e.g. migrated data, data validations)
- The eQube-MI software and transactions have been robust.
- Simple user interface gives direct access to transactions for the support team.
- Use of XML means data is easy to view and understand.
- Straightforward to deploy eQube-MI events and/or Java "war" files.

Experience of working with eQ Technologic has found them to be responsive in dealing with issues in short timeframes. eQ-Technologic have an understanding of the business processes and customer requirements that facilitates a more rapid delivery. eQ also have a solid understanding of Siemens PLM products through close relationships with the vendor.