Jotne EPM's *EDMmodelServer*™(plcs)—Using PLCS to Harmonize Product Development and Support Environments

CIMdata Commentary

Today's manufacturing industries are under continuous pressure to deliver competitive products faster. At the same time, they must reduce the cost of development and the cost of product ownership, protect their intellectual property while working in shared environments, and sustain business growth and competitiveness. In order to achieve this goal, collaboration across the product development lifecycle is critical. Unfortunately, collaboration introduces many complications that must be addressed in order to ensure the integrity and consistency of product development information and processes that span increasingly-complex business environments (e.g., environments that bring together multiple companies, each with their own systems and processes). Effective collaboration throughout a product's lifecycle requires the ability to accurately integrate and share product data that is created and used within multiple applications—and that environment must be sustained for as long as the product is in use; sometimes even longer.

Addressing these issues requires establishing a consistent source of knowledge for all product-related information and processes that knowledge workers can share in real-time. They need to be able to have connected processes so that information flows to workers when and as needed. The business value in such an integrated, end-to-end environment is that product information and processes are optimized not for individual departments or groups, but for all extended enterprise participants and across the full product lifecycle. However, when creating these complex networks, it is frequently impossible to mandate a heterogeneous set of applications. Each partner and customer will have made their own Product Lifecycle Management (PLM) investments and will need to leverage them in the most effective manner possible.

In the past, deploying a comprehensive PLM environment has typically required implementing a set of applications (or applications modules) that encompass and support selected PLM functionality. These applications are then integrated to provide transfer and use of product-related information in as seamless and transparent a manner as possible, as well as providing support for the execution of end-to-end processes across the appropriate applications. As PLM environments have expanded to encompass more of the product lifecycle, more and more applications are being used and the number of integrations continues to increase significantly. Additional resources—both human and financial—have to be committed to maintain and upgrade the overall environment.

One approach to this problem is to establish and use a common or master data unified repository in which product and process information from many sources (e.g., systems, companies, etc.) can be merged and consolidated. This repository must be designed to handle many product versions and configurations and distinguish between information packages received from multiple suppliers and partners, and delivered to many customers.

Creating such a repository requires using a consistent set of data exchange standards. One standard being adopted is ISO 10303-239 (PLCS). Product Lifecycle Support (PLCS) is intended to cover the information required to support a product throughout its life. It is a member of the ISO 10303 family of standards, generally known as STEP (STandard for the Exchange of

Product model data). PLCS-compliant solutions are intended to provide the capability to support all the information required to design maintenance solutions for a product through life, to track planned and unplanned maintenance based on the actual state of the product, and the changing configuration of the product as components are replaced and repaired. PLCS can also be used to associate technical documentation and training materials to various valid product configurations. PLCS includes definitions for:

- Information required to maintain a complex product
- Information required for through life configuration change management of a product and its support solution
- Representation of product assemblies
- Identification and representation of parts, their versions, definitions, and documentation and management information, such as dates and approvals assigned to parts
- Representation of a product through its entire lifecycle
- Specification and planning of activities for a product
- Representation of the activity history of a product
- Representation of the product history
- Associating technical documentation and training materials to various valid product configurations

Interfacing applications to the unified PLCS repository is facilitated by the concept of Data EXchange specifications (DEXs). These are subsets of the PLCS model dedicated to specific domains. They are standardized at a business case level and enable a consistent implementation of AP239. Business DEXs are the lowest level of complete data exchange specifications and address the needs of specific data exchanges between existing applications. For example, DEX 1 is for interfacing PLM applications to the PLCS model and DEX 3 is made for interfacing Integrated Logistics Support (ILS) applications to the PLCS model.

Jotne has developed a solution based on international open standards that fully supports PLCS. The *EDMmodelServer*™(plcs) functions as a PLCS repository housing the common product and process information used across product lifecycle related applications, e.g., Product Data Management (PDM). The EDM platform also provides high-level API's (DEXs) facilitating the interfacing of specific domain applications—PDM, ILS, etc. This ensures that the applications connected to the central repository are replaceable without loss of information both as it is created, and then into the future as it is used throughout a product's life. Information owners are better able to change or update their applications and still maintain control of the information stored in the repository.

The EDM solution is not meant to replace the PLM and PDM management applications that may be used by the various partners and customers, but is intended to provide functionality that can be applied to information from all connected applications. The domain-specific operations will still execute in specialized applications while the PLCS repository manages the total product-related information and provides supervisory functionality related to the information stored in the repository. A typical implementation would include a neutral PLCS repository (e.g., EPM's Model Server), data exchange packages (DEXs) for integration other information sources and repositories, a PLCS reference data tool and library, and application adaptors as shown in Figure 1.

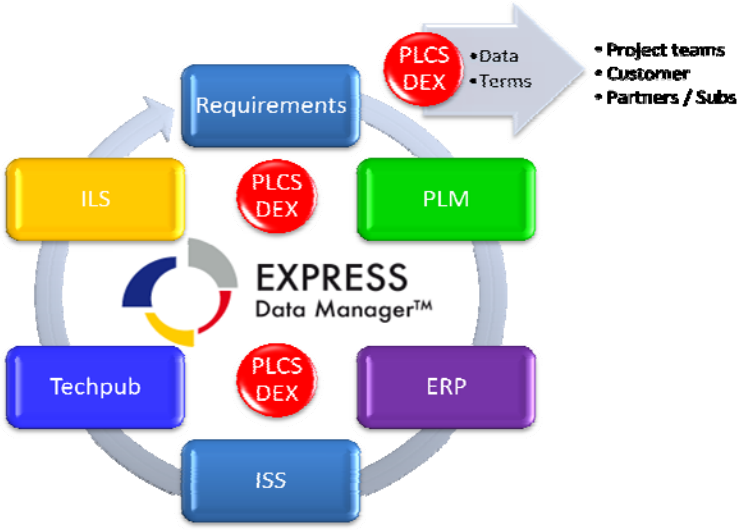

Figure 1—Example of an *EDMmodelServer*™(plcs)-Based Environment

The *EDMmodelServer*™(plcs) supports functions such as common check-in/check-out, validation, business and engineering rule checking, etc. For more information about Jotne's *EDMmodelServer*™(plcs) please go to www.epmtech.jotne.com.

Since all data is converted via DEXs and stored in a PLCS definition, the information can be relatively easily monitored for consistency during the ongoing exchange processes. This data validation helps maintain product information quality and integrity even in highly-distributed and heterogeneous environments.

Another benefit of the EDM solution is that because all information is converted and stored in a single PLCS-based repository, a master product baseline can be established by using baseline information contained in multiple sources and merging them within the PLCS repository. The common baseline can then be used to support baseline comparison and reconciliation throughout the product's lifecycle and across the product states.

Many products that have extended lifecycles require companies to archive approved data and be able to retrieve that information when it may be needed for later operational or legal processes. This may be related to certification, product liability, knowledge management, manufacturing processes, or modifications on products and documents as well as later product support. A major challenge related to long-term archiving and reuse of product data is that the need for retention is frequently much longer than even the operational life of the product. This means that the applications using the data in the future are mostly unknown. Another challenge is to retain enough relevant information to serve products through this time span.

Using PLCS and the *EDMmodelServer*™(plcs), a company can implement an archiving system that is based upon the properties of the products and not upon the functionality of the application or applications that produced the data. This enables the information to be maintained and used throughout the long lifecycles of products such as airframes and ships. Other benefits of using the *EDMmodelServer*™(plcs) and PLCS include:

- Reducing the cost of developing and maintaining interfaces across the supply network
- Enabling customers, partners, and suppliers to work together while using the different development applications that each has chosen for the individual business
- Establishing a common terminology used throughout the product lifecycle

CIMdata thinks that PLCS enabling solutions, like Jotne's *EDMmodelserver*™(plcs), offer companies who are developing and supporting complex products and working with diverse partners and customers, a method for the effective consolidation and management of product information both in the short- and long-term. Establishing a unified PLCS repository built upon open international standards facilities long-term information independency and enables integration and management of diverse product data and processes.

About CIMdata

CIMdata, a leading independent worldwide firm, provides strategic consulting to maximize an enterprise's ability to design and deliver innovative products and services through the application of Product Lifecycle Management (PLM) solutions. Since its founding more than 25 years ago, CIMdata has delivered world-class knowledge, expertise, and best-practice methods on PLM solutions. These solutions incorporate both business processes and a wide-ranging set of PLM enabling technologies.

CIMdata works with both industrial organizations and suppliers of technologies and services seeking competitive advantage in the global economy. CIMdata helps industrial organizations establish effective PLM strategies, assists in the identification of requirements and selection of PLM technologies, helps organizations optimize their operational structure and processes to implement solutions, and assists in the deployment of these solutions. For PLM solution suppliers, CIMdata helps define business and market strategies, delivers worldwide market information and analyses, provides education and support for internal sales and marketing teams, as well as overall support at all stages of business and product programs to make them optimally effective in their markets.

In addition to consulting, CIMdata conducts research, provides PLM-focused subscription services, and produces several commercial publications. The company also provides industry education through PLM certificate programs, seminars, and conferences worldwide. CIMdata serves clients around the world from offices in North America, Europe, and Asia Pacific.

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