



Dassault Systèmes' PLM Solutions for the Mid-Market

*Solutions for Mid-Sized Companies through CATIA
PLM Express and ENOVIA SmarTeam*

September 2007

A CIMdata Program Review

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*Produced by
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1. Introduction

While Product Lifecycle Management (PLM) as a strategic approach has been validated as essential for large enterprises around the world, mid-sized companies continue to face major challenges as they seek to successfully compete in today's global markets. Large companies increasingly invest in PLM with the confidence that it will increase their effectiveness and their ability to bring innovative products to market. Smaller companies share similar needs as their larger contemporaries and lack the ability to invest in high-cost solutions. However, over the last several years, PLM has clearly become more attractive to mid-sized companies both in capability and in total cost of ownership as PLM suppliers have introduced solutions targeted at their needs and financial capacity.

Dassault Systèmes is a world leader in Product Lifecycle Management (PLM) solutions. Its offering for the mid-market is intended to provide a broad PLM program for mid-sized companies at a reasonable cost of ownership. This paper focuses on this offering which is comprised of CATIA PLM Express (CPE) with the embedded SmarTeam Design Express (SDE) packages. CPE provides mid-sized companies with access to CAD, NC, and analysis capabilities in an integrated and extensible package. SDE supports design collaboration on design related data such as drawings, DMU, manufacturing, analysis and other related product data.

This paper provides perspective on the CPE program including its embedded SDE. The following sections of this paper address:

- *Business Opportunity*—An introduction to the business problems faced by mid-sized companies and PLM's impact.
- *Dassault Systèmes and CPE Program*—A brief introduction to Dassault Systèmes' CPE portfolio, with a perspective on its approach to addressing the business problems of mid-sized enterprises.
- An introduction to the ENOVIA SmarTeam offering.
- *Customer Assessment*—A brief review of experiences of two Dassault Systèmes mid-market users.
- *Summary*—A summary of findings.

2. Business Opportunity

All sizes of companies throughout the world struggle to find ways to compete more effectively, not only to survive, but also to thrive. Information technologies and the processes that they enable provide help in addressing these challenges. PLM is one of the most significant initiatives that has been introduced into industrial companies in the last several years to support stronger product development operations and foster innovation.

PLM is not just a computer application; rather it is a business strategy that more effectively supports the lifecycle of a company's products with processes that enable collaboration throughout the lifecycle and across partner networks. It includes technologies that support product and process development, and processes that foster innovation at all steps of the lifecycle.

CIMdata defines PLM as a strategic business approach that applies a consistent set of business solutions in support of the collaborative creation, management, dissemination, and use of product definition information across the extended and increasingly global enterprise, and spanning from product concept to end of life—integrating people, processes, business systems, and information. PLM forms the product information backbone for a company and its extended enterprise. It is composed of multiple elements including: *foundation technologies* and standards (e.g., XML, visualization, collaboration, enterprise application integration, etc.), *information authoring and analysis tools* (e.g., mechanical design, electronics design, software engineering, manufacturing process design, technical publishing, finite element analysis, etc.), *core functions* (e.g., data vaults, document and content management, workflow, product structuring, program management, etc.), *functional applications* (e.g., configuration management, engineering change control, simulation, etc.), and *business solutions* (e.g., new product introduction, supply chain collaboration, maintenance repair and overhaul, etc.) that incorporate best practices and methods.

While PLM historically has been pioneered in larger enterprises that have invested the resources necessary to understand the approach, improve the technologies, validate the benefits, and establish the organizational practices necessary to make PLM effective within their organizations,

today enterprises of all sizes can benefit from PLM. Indeed, mid-sized companies require and desire similar support for collaboration and for innovative approaches to their own product development problems.

Although mid-sized companies have many of the same requirements for PLM, they have characteristics that have been especially challenging for suppliers of PLM solutions including:

- Desire for rapid business impact
- Need for low total cost of ownership (software, services, support, etc.) with low initial cost and low operating costs
- Inability to tolerate costly risks
- Need to minimize implementation support and cost to reach production operation
- Limited information technology resources available
- Need for pre-configured processes and templates and guidance for achieving best practices
- Reliance on common PC and web platforms
- Limited resources for modifying current processes
- Need to improve the efficiency of design release and engineering change processes
- Need to collaborate with suppliers, customers, and partners
- Need for embedded visualization and digital mockup capabilities

PLM continues to mature as it is more extensively used in businesses around the world. However, to be accepted by mid-sized companies, it must be delivered in an appropriate form. Mid-range PLM must be provided as:

- Cost-effective solutions (software and services) with low initial cost and low ongoing costs
- Limited installation and implementation support required to achieve production operation
- Packaged solutions with pre-configured processes, providing templates and guidance for achieving best practices with the solutions

Most PLM solutions targeted at mid-sized and smaller companies have not included support for a full PLM approach. Typically, PLM-related offerings have only included individual applications, as opposed to a full suite of PLM capabilities. As a result, customers are responsible for finding the set of appropriate components that fit into their overall PLM strategy and acquiring these from different suppliers. Mid-sized companies simply do not have the resources to research and assemble such functionality in this way. However, Dassault Systèmes' CPE program is intended to support a broad PLM strategy for mid-sized companies. Clearly, mid-sized companies are ready for

PLM, and Dassault Systèmes is attempting to satisfy that demand.

Mid-sized companies can look forward to many business benefits from PLM:

- Reduced errors and rework by having a single source of product definition information
- More accurate and managed BOMs and configurations that ensure downstream quality
- Increased design commonality and data reuse supported by powerful and flexible search capabilities
- Simplified design release and engineering change workflows resulting in faster, lower-cost design processes
- Easier, less disruptive move from a 2D to 3D design process
- Standardized and optimized business processes
- Better management of design supply chain collaboration processes
- Convenient, authorized access to secure product information for people throughout the company
- Enhanced bidding and cost estimation for new projects
- Better standard parts management, reduced inventory costs
- Develop reusable project templates to capitalize on lessons learned

3. Dassault Systèmes and its PLM Offering for Mid-Market Companies

3.1 Dassault Systèmes

Dassault Systèmes (NASDAQ:DASTY, Paris:DSY) has a worldwide presence and is one of the major suppliers of PLM solutions to industry. Their software and related services revenues in 2006 exceeded \$1.5 billion. According to CIMdata's research, during 2006 Dassault Systèmes was the largest overall PLM revenue generator among the PLM Mindshare Leaders. Mindshare leaders are the companies with the largest and most comprehensive PLM implementations, and those perceived by customers to be thought and technology leaders. In order to rank among PLM mindshare leaders, companies must have a comprehensive PLM product and service offering that covers the entire product development cycle and supporting business processes. PLM revenue includes that derived from the main functional areas of PLM from design authoring and analysis to enter-

prise collaboration to digital manufacturing as well as other complementary applications. Dassault Systèmes continues to grow as a global supplier of PLM solutions with offices and customers around the world. Dassault Systèmes reports that they have more than 90,000 customers in 80 countries. Overall, Dassault Systèmes' PLM market position is very strong.

The Dassault Systèmes portfolio provides a broad suite of PLM offerings including CATIA for product designing, SolidWorks for 3D mechanical design, DELMIA for digital manufacturing, SIMULIA for engineering analysis, and ENOVIA (ENOVIA VPLM, ENOVIA MatrixOne and ENOVIA SmarTeam) for global collaborative lifecycle management. Dassault Systèmes' program of acquisitions and partnerships continues to broaden their PLM offerings and expand their business into additional industries.

Leveraging its knowledge and customer experience Dassault Systèmes announced the CPE portfolio for mid-sized companies in October 2006. CPE provides a quick-start PLM package for collaborative product development through CATIA V5 for design integrated with ENOVIA SmarTeam as its collaborative product data management platform. This announcement targets the growing demand for PLM among mid-sized companies. It leverages Dassault Systèmes' strengths in and the breadth of their PLM product lines so as to expand their coverage of PLM to mid-sized companies and enhance their own business growth.

3.2 The Mid-Market PLM Program

CATIA PLM Express with ENOVIA SmarTeam

Dassault Systèmes historically has concentrated on solution suites that were intended to support larger customers. With CPE, Dassault Systèmes has established a serious program for mid-sized companies. Thus, they are now a PLM supplier that offers a range of solutions for companies regardless of size.

CATIA TeamPLM, which includes "SmarTeam Design Express for CATIA" is the core configuration of CATIA PLM Express. It provides customers with access to the CATIA

modeler for product design, knowledge capture and re-use in a collaborative environment, embedded data viewing and markup tools, Microsoft Office integration, vaulting, and other document management capabilities that work throughout the suite. Dassault Systèmes states that this provides optimized CATIA design management and collaboration as well as a solid foundation primed for PLM solution scaling. Existing customers can move to this new offering from their existing CATIA seats.

As shown in the following figure, CPE provides six user roles and has 44 Express options that cover the complete CATIA portfolio, all on top of CATIA TeamPLM.

The objective of CPE is to provide clear value and clear return on investment for various industry segments. Further, Dassault Systèmes states that CPE is targeted at teams with up to 50 users, which defines its mid-size focus. CPE helps companies in multiple industries by delivering the following values:

- Native access to virtual product information directly from within CATIA
- Pre-customized product information for managing assets
- Reuse of existing assets
- Fully secured environment

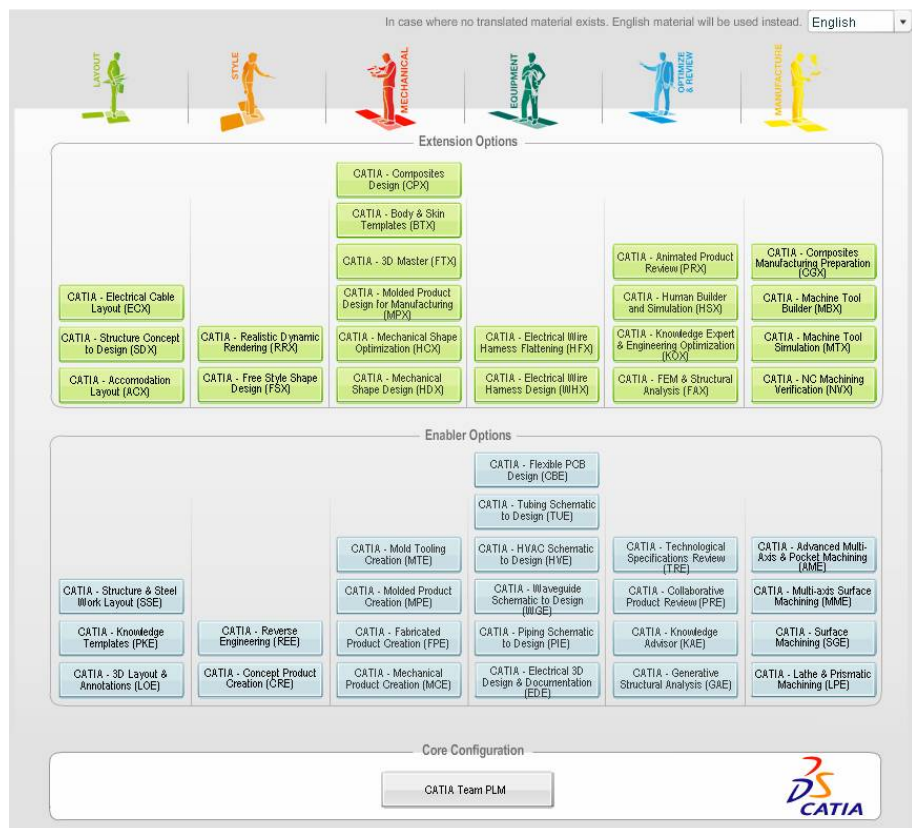


Figure 1—CATIA Team Collaboration Using ENOVIA SmarTeam

- Collaborative design iteration
- Traceability for full product lifecycle management
- Rapid deployment of a collaborative environment (claimed to require less than 10 days to implement)
- Access to the full scope of CATIA's product design portfolio

Knowledge-based design is included and provides:

- Knowledge capture and reuse for innovation and rapid design change
- Easy product creation
- Interactive decision making through instant collaborative reviews

CPE is built on the Microsoft Windows environment.

CATIA

The full suite of CATIA solutions is available to a CPE user. The solutions are delivered as options that can be licensed individually based on each user's particular needs. Forty-four of these are targeted at the typical needs of six types of roles found in mid-sized companies in various industries.

- Layout
- Style
- Mechanical
- Equipment
- Optimize and Review
- Manufacture

Solutions for these are specifically packaged for delivery with CPE. The figure above shows these solutions in relationship to the types of roles. Twenty-three are basic enablers and the other twenty-one provide extended capabilities.

The packaged solutions provide a broad range of design, analysis, and manufacturing capabilities. Some examples of these are: For design, these range from shape design and layout to design detailing of parts, assemblies, and tooling as well as routed systems design. For manufacturing, NC, machining and manufacturing process design are supported. For engineering analysis and simulation, there are modules that support design optimization, FEM/FEA, structural analysis, and ergonomic analysis.

CPE provides capabilities that support many of the activities that companies have to consider when they are designing simple to complex products. They also have access to a substantial number of additional solutions from more than 300 CAA V5 partner developers. Many of these are for highly-specialized disciplines.

These packaged solutions have been given a new, simplified user interface which is standardized across the suite of solutions. This should result in reduced training and retraining.

The CATIA solutions use 3D XML as a 2D and 3D data viewing format. This can be shared with other people who do not have access to CATIA.

ENOVIA SmarTeam

ENOVIA SmarTeam is a product within the ENOVIA brand portfolio of Dassault Systèmes. ENOVIA SmarTeam delivers collaborative Product Lifecycle Management to mid-market businesses and engineering departments of larger enterprises. Its program is targeted to provide business benefits by optimizing design and engineering processes throughout the product development lifecycle across the global organization and with value chain partners.

Providing access to product-related information across disciplines and locations, ENOVIA SmarTeam supports a variety of roles and functions within organizations including marketing, product managers, designers, engineers, management, purchasing and manufacturing. ENOVIA SmarTeam enables authorized teams to manage and monitor processes in a collaborative manner to accelerate product development.

ENOVIA SmarTeam offers a modular implementation approach to PLM for mid-sized companies. They can start with document management, and then extend to managing more complex product structures. Product development is accelerated by users collaboratively managing item lifecycles and manipulating Engineering BOMs (EBOMs). These BOMs are automatically generated from the product structures in integrated CAD solutions and may be further manipulated by various filters and automated change processes (i.e., workflows).

ENOVIA SmarTeam provides collaborative offerings focused on product development processes supporting design, engineering and enterprise activities. A unified platform across all ENOVIA SmarTeam products enables collaboration between users across these different areas. Companies can scale up to enable collaboration across global organizations or supply chains, according to their needs.

ENOVIA SmarTeam Express offerings are pre-packaged solutions based on the standard offerings that function as quick-start PLM projects, providing a foundation for growing PLM functionality one step at a time. They enable companies to quickly roll out a solution.

ENOVIA SmarTeam Design Collaboration allows design engineers to manage design activities in an immersive multi-CAD, multi-data environment. *SmarTeam Designer* provides integrations to CATIA® V5, Multi-CAD solutions (SolidWorks, PRO/ENGINEER, Solid Edge, Autodesk Inventor, AutoCAD, and others through various third-party CAD integrations), Microsoft Office and other tools, directly from the designer’s desktop. Digital mockup and data management help optimize daily work. A CATIA V5 model comparison tool facilitates supply chain collaboration.

SmarTeam Editor allows authorized users within and beyond the design department to manage links and releases of technical documents with data integrity ensured. Advanced search and visualization and markup are supported across more than 450 formats, and accelerate collaboration across the organization.

The **SmarTeam Design Express package (SDE)** is a quick start entry-level PLM solution offering an “out of the box” Design Collaboration scenario with a built-in upgrade path. SmarTeam Design Express for CATIA is a basic CATIA data management package which works with CATIA V5 to form the CATIA PLM Express offering. It includes a native CATIA integration with predefined database structure and templates as well as scripts and best practice methodologies that simplify implementation. However, companies can later expand and customize this open solution based on their needs. The SDE for Multi-CAD package supports SolidWorks, Solid Edge, Autodesk Inventor, and Pro/ENGINEER.

Design elements comprise only some of the many components that impact product development. Using a structured method to manage product definition and behavior around the Engineering BOM lets companies gain further PLM benefits. **ENOVIA SmarTeam Engineering Collaboration** is a PLM offering that provides both item and BOM management. It enables users to leverage data and gain better visibility and control over product development processes. ENOVIA SmarTeam automates, standardizes and accelerates change management and other processes, including those with supply partners, through configurable workflows.

Users can execute different typical roles depending on their context in the product development process. For example, in *SmarTeam Engineer*, different users within a given organization, such as a product manager, configuration manager, configuration engineer, CAD designer, SRM manager working with a sub-contractor, or a production manager can manage EBOMs, MBOMs, item lifecycles, engineering releases and change processes.

ENOVIA SmarTeam Enterprise Collaboration extends access to product knowledge, and standardized processes to any authorized enterprise workers, allowing them to share any type of product information across the globe, across processes, and across applications. Managers can use *SmarTeam Navigator* to monitor product information and join in business processes via a web-based environment. *SmarTeam Community* supports external partners that are incorporated into business processes yet have access to only selected product data.

The Multi-Site offering addresses distributed environment scenarios typical for globalization, duplicating the benefits of PLM across sites. Gateway connectivity, through Enterprise Application Integration (EAI) middleware, delivers collaborative benefits across enterprise systems, providing knowledge flow between product development and manufacturing by interconnecting the PLM system with ERP, MRP and other enterprise applications.

The ENOVIA SmarTeam portfolio enables companies to increase productivity and accelerate product development, bringing innovative products to market faster. Ideas can be shared across teams regardless of position, location, or function.

Figure 2 illustrates the scope of the ENOVIA SmarTeam offering incorporating the different PLM roles typical in global product development organizations.



Figure 2—ENOVIA SmarTeam Core Product Portfolio

4. Customer Overview

In the process of writing this paper, CIMdata interviewed current users of Dassault Systèmes mid-market solutions package. The following comments summarize the comments of two of those customers.

Peltor (Sweden) designs and manufactures communication and hearing and eye protection equipment. They have been using CATIA and SmarTeam for a number of years to support their worldwide development teams. The bottom line for Peltor is really the top line impact of PLM. They could not have grown as quickly without PLM. Their ability to find and use all kinds of product data has allowed them to add new products and increase engineering capacity at the same time. They continue to improve their time to market.

According to Mr. Hans Wickström, European IT Director, “The big advantage for Peltor is that these solutions support not only engineers needing CAD data, but also support non-engineering users through workflows that streamline communication among these diverse groups and provide data throughout the product development lifecycle.”

Hidrostral AG (Switzerland) specializes in pumping systems. For example, they build pumps for moving fish from nets into a boat, then from the boat into the fish processing plant without damaging the fish, to transporting glue, sludge, or many other materials. In order to save development time and cost, they have integrated their product development processes around CATIA PLM Express.

Their pumps typically have screw centrifugal impellers. The curves for these pumps are defined by calculations done in Excel. The surface parameters are transferred into CATIA for design, analysis, and finally generation of NC programs which are sent to the shop floor. NC simulation is integrated into the product development process alleviating the need for test production on the actual machine tools. Production planning is supported by the 3D XML Viewer for visualizing operations on the shop floor.

ENOVIA SmarTeam will eventually manage all 3D data, drawings, and product information and be used throughout the entire product lifecycle including sales, service, project management, documentation, and in the worldwide distribution centers.

Hans-Peter Haas reports that Hidrostral has recovered their investment in CATIA PLM Express very quickly.

5. Program Assessment

Users can configure CPE using an on-line, interview-driven configurator. This helps them select the specific tools that best fit their industry, role, and business requirements. Current CATIA users can upgrade their existing licenses to be CPE licenses.

CPE is a key program for Dassault Systèmes and for the PLM market in general. CPE helps them move from high-end PLM to PLM for mid sized companies. This is a big transition for Dassault Systèmes since their reputation has been built on PLM implementations in the world’s largest enterprises. Now, with CPE, they have the challenge of demonstrating that they can successfully implement PLM in small- and mid-sized companies.

CPE, including CATIA and ENOVIA SmarTeam, delivers a very broad set of scalable PLM capabilities, while competitive mid-market-focused PLM programs are generally limited to a narrow set of PLM capabilities. Dassault Systèmes has a challenge in establishing a network of partners that can effectively deliver PLM to mid-sized companies. Dassault Systèmes and their partners need to be able to help customers establish an overall PLM vision, while implementing individual products at a pace that matches the needs and abilities of those customers. The products that make up the mid-market offering have been available to the market for a long time and generally receive good remarks from users. However, one of their current customers observed that there is still room for improvement in the Web client compared to the native client.

ENOVIA SmarTeam has a long history of success in the mid-market. This should ease the transition of Dassault Systèmes into the mid- market sector. A high level of integration between SmarTeam and the CATIA components of CPE will remain critical to the program’s success. Overall, we like this “broad PLM” approach and believe that it can help mid-sized companies adopt PLM to improve their ability to take advantage of collaboration to support innovation and competitiveness.

6. Summary

Businesses around the world are investing in PLM at increasing levels as its worth has been validated in enabling companies to become more effective, more innovative, and more successful. However, PLM has been mostly implemented by the world’s larger organizations. Now, mid-sized enterprises can realize the benefits that PLM has offered larger firms. However, while many of their

challenges are similar to those of larger firms, they demand PLM solutions that are specifically suited to their special needs.

Thus, Dassault Systèmes has launched their CPE portfolio of offerings to provide broad, extensible PLM support to mid-sized companies. Although a focus on mid-sized companies has not been typical for most of Dassault Systèmes historically, ENOVIA SmarTeam has been successful in the mid-market for more than a decade. Dassault Systèmes has clearly demonstrated their commitment to the CPE program and to mid-sized companies. A key aspect of Dassault Systèmes' CPE is that its CATIA component is a subset of its high-end CAD offering. This allows CPE users to access the full breadth of CATIA's capabilities and to expand their PLM scope with ENOVIA SmarTeam.

In summary, CIMdata believes that mid-sized companies can benefit tremendously from the implementation of PLM strategies and solutions. We also believe that the lessons learned by mid-sized companies in their adoption of PLM will benefit all enterprises, regardless of size. We welcome Dassault Systèmes' CPE portfolio, and their focus on providing broad-based PLM solutions to mid-sized companies. We are impressed with Dassault Systèmes' commitment to the mid-market, and encouraged by early indications of its positive reception among mid-sized customers.

About CIMdata

CIMdata, an 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. CIMdata offers 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 by providing world-class knowledge, expertise, and best-practice methods on PLM solutions.

In addition to consulting, CIMdata conducts research, provides PLM-focused subscription services, and produces several commercial publications. The company also provides industry education through international conferences in the US, Europe, and Japan that focus on PLM. CIMdata serves clients worldwide from locations in North America, Europe, and Asia Pacific.

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