

# **ENOVIA SmarTeam Engineering Express: A product management system for mid-sized customers**

A review by TechniCom Group, June 2008

## **About the company**

Founded in 1995, SmarTeam was an independent company until Dassault Systemes acquired it in 1999. In 2006 SmarTeam became part of the ENOVIA brand organization and is now called ENOVIA SmarTeam. The other brands are ENOVIA VPLM and ENOVIA MatrixOne. The ENOVIA SmarTeam brand is primarily focused on offering easily installable and easily operable product lifecycle management solutions to small to mid-size customers. Their solutions are available from a variety of resellers worldwide, including both IBM and Dassault Systemes direct sales channel. Their exclusive focus on mid-sized customers differentiates ENOVIA SmarTeam products from other product management software.

## **Mid-sized customers need product management**

PLM and PDM differ in that PDM normally focuses on design data management, while PLM tries to manage product data from birth to death, thus the term product lifecycle. PDM typically manages the product structure or the EBOM and usually includes versioning.

Until recently, implementing a product management system meant a costly, long-term project. Prospective buyers usually engaged in an elaborate rethinking of how they designed and delivered products, their existing data structures, and how to integrate multiple CAD, ERP and legacy data systems. Frequently, an external systems integration company was required to customize, train and install the product management system. The result was often a costly and time-consuming implementation, and one that might be difficult to change later.

This is where ENOVIA SmarTeam's Express solutions differ, offering out-of-the-box solutions for CAD data management (Design Express) and Item/BOM management and engineering change management (Engineering Express). The Engineering Express solution supports methodologies "from concept to manufacturing." The Express Solutions include the capabilities of document management related to changes, pre-defined workflow templates for item release, ECRs, ECOs, and more. With its pre-packaged offering, installation and follow-on growth, this PLM system does not require a large IT staff. It requires low IT investment in terms of time and resources, a primary contributor to its low total cost of ownership. It does this magic by using its years of experience and from installations at more than 6000 customers.

## **Potential benefits of ENOVIA SmarTeam Engineering Express**

ENOVIA SmarTeam Engineering Express uses predefined best practices for working with bills of material starting with Engineering Bill of Materials (EBOMs) from concept and then progressing to Manufacturing Bill of Materials (MBOMs) for manufacturing phases of the product lifecycle. Managing BOMs in a controlled manner with SmarTeam Engineering Express allows companies to achieve substantial benefits, such as better control of Engineering changes (ECs), better reuse of designs, and accelerated new product launches. Reducing and controlling ECs results in higher productivity and lower costs.

SmarTeam Engineering Express resolves a thorny problem in MBOM development – how to synchronize the EBOM with the MBOM. An item/BOM centric approach and tailorable

workflow processes, support both mechanical and electronic CAD systems using a role-based approach, which simplifies deployment. Example roles are Designer and Engineer. Designers manage designs in a multi-CAD, multi-data environment, while Engineers manage EBOM, MBOM, item lifecycle, engineering release and change processes.

### The methodology

ENOVIA SmarTeam positions SmarTeam Engineering Express as deploying best practices in working with Engineering BOMs, starting from concept and continuing through development and eventual creation of the Manufacturing BOM (MBOM). The company envisions a scenario consisting of five main phases of the product lifecycle:

- Concept (Phase 1) focuses on customer requirements and product definition.
- Planning (Phase 2) focuses on feasibility and specifications. During this planning phase the major activities are analysis of existing products, keeping in mind the possibility of product reuse. Cost analyses are critical in this phase.
- Development (Phase 3) focuses on the engineering implementation.
- Test and Validation (Phase 4) captures test results and encourages re-design as needed.
- Production Planning (Phase 5) supports the development of an MBOM, release to an ERP system, and maintenance of item related production drawings.

All these phases are executed in a formal environment using pre-defined, SmarTeam Engineering Express best practices workflow processes. The phases are depicted in the figure below.

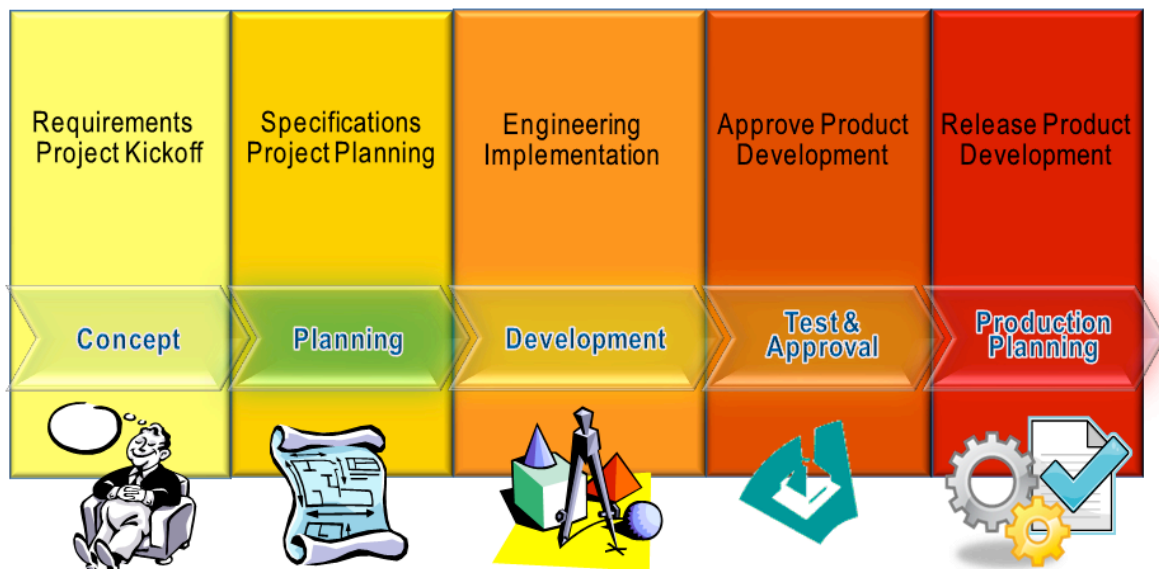


Figure 1: The five main phases of the product lifecycle

SmarTeam Engineering Express supports **the concept phase** with requirements management, project management, and its workflow design for reusing existing design data. Requirements management allows capturing all relevant documents surrounding the concept, including requirements, customer needs analysis, market research, and other related documentation.

During **the planning phase**, the company makes decisions on how to deliver the product considering optimal costs, time to market, and how best to reuse existing product data. SmarTeam Engineering Express supports the planning phase with project and resource

management, working with Statement of Work (SOW) documents describing the high level plans, and analyzing key product elements such as product costs and product weight. Some companies combine the planning phase together with the concept phase. Based on such information, the company can make a Go/No Go decision for the project and can define the stages of such a project.

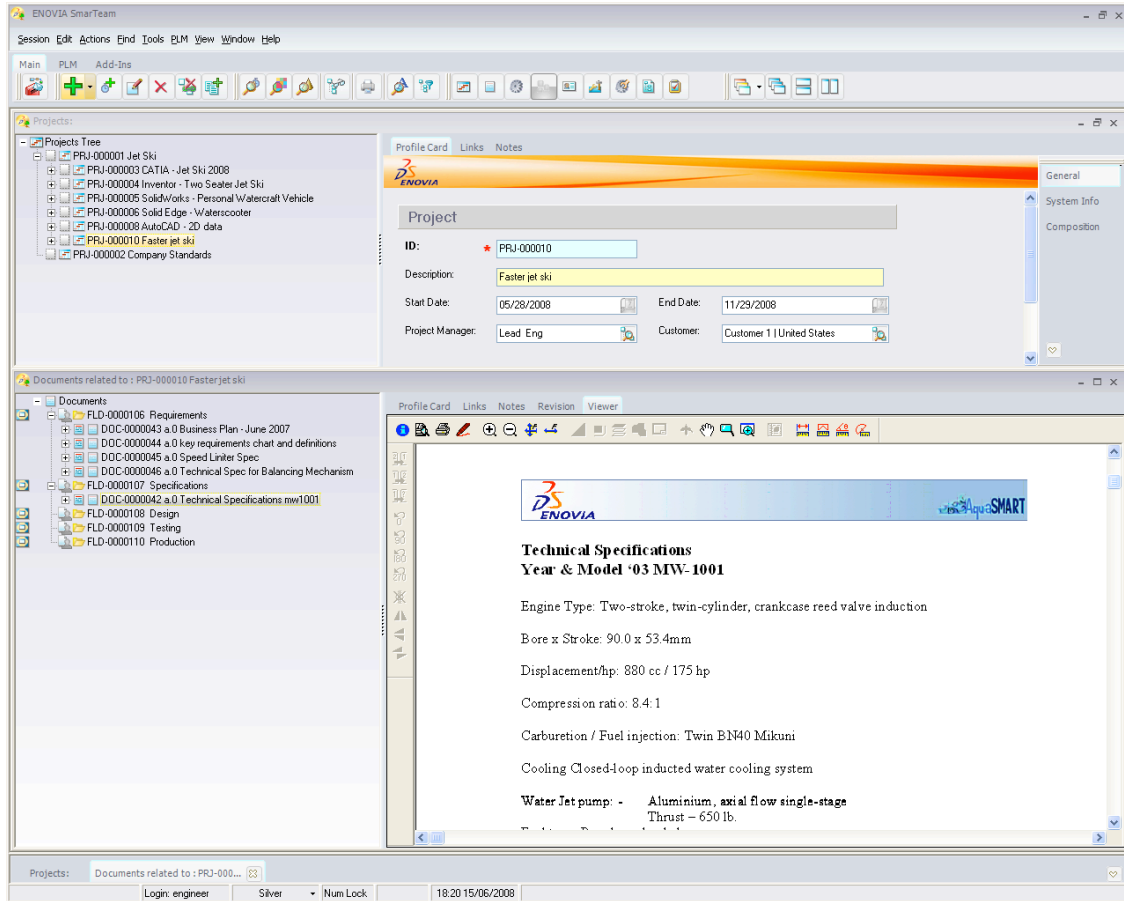


Figure 2: Project management in SmarTeam Engineering Express

In the **development phase** a substantial commitment of resources takes place. A company typically considers reuse by starting with an existing Bill of Materials as well as other existing design data. During the development phase the company must enable concurrent engineering with multi-party network access to the data, collaboration with vendors and suppliers, configuration management, and Engineering Change (EC) management. The goal is for an EBOM to be created, managed and approved for production purposes. Initially, the EBOM starts with the top levels, the details of each level being further defined by the designers. Such a "top down Engineering" approach starts from the EBOM and eventually synchronizes the design of CAD data with non-CAD data that combine to make up the EBOM. Design data captured from the CAD systems are approved and managed as part of the approval process of the new product. The EBOM usually includes various items in addition to CAD data, such as externally sourced manufacturer items, software items describing the software required to operate the product, standard parts, electronic designs, and other related items. SmarTeam Engineering Express contains the required tools to import, manage and approve these types of items.

Engineering changes are supported through Engineering Change Requests (ECR) and Engineering Change Orders (ECO). Some companies may combine the ECR as part of the

ECO. Many companies today manage their EC process manually or through Excel/Word sheets. While this is often sufficient to track the status of ECs, SmarTeam Engineering Express adds enormous value and visibility with its predefined workflows for managing the ECR and the ECO processes.

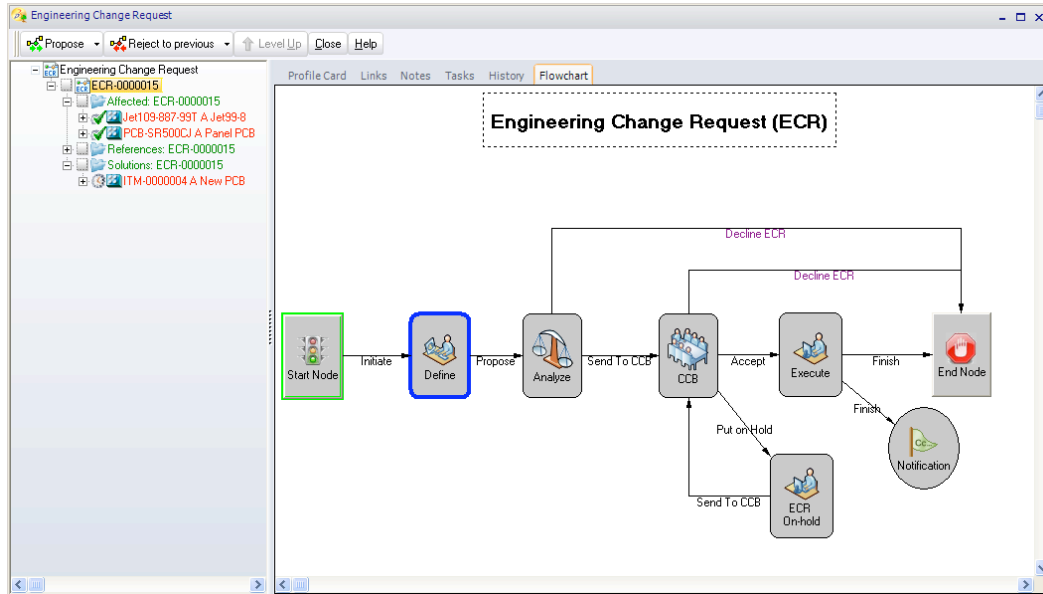


Figure 3: An example of an ECR process in SmarTeam Engineering Express used for requesting an engineering change. SmarTeam Engineering Express allows easy modification of its workflow processes during implementation.

During **the testing and approval phase**, the EBOM is used to manufacture a prototype for testing purposes. Customer acceptance and on-site installation of the prototyped product might be required. SmarTeam Engineering Express helps companies capture their test results, and relate them to the products as part of the product approval prior to production. SmarTeam Engineering Express supplies easy software tools to upload such data and enable the company to store testing results as part of the product data. During the testing phase, changes to the product might be required. Such changes are fully supported using the predefined ECO templates.

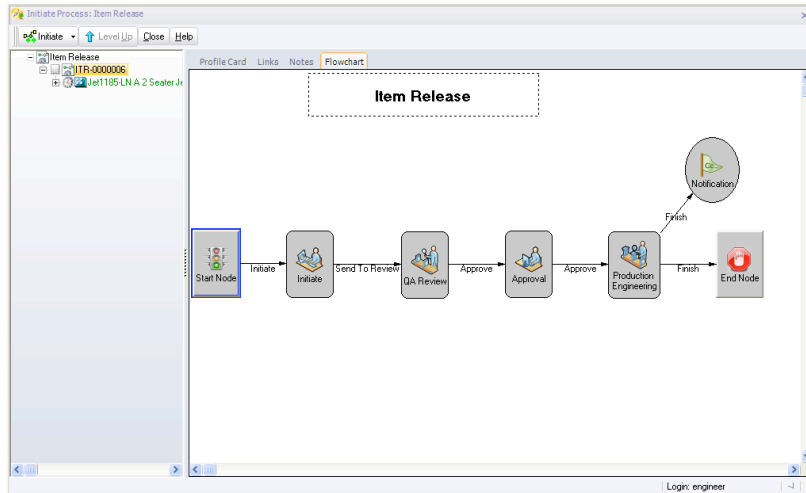


Figure 4: An example of an item release process in SmarTeam Engineering Express used for approving new items and releasing them to production

To prepare for **the production phase**, users create the Manufacturing BOM (MBOM) as a base for the production planning, including reference to production data such as production specs, production programs, etc. When the MBOM is released for production, data is readily transferred to an ERP system from SmarTeam, enabling the ERP system to start the production planning and purchasing processes.

Structure	State	Description	Item Type	Quantity(L)	Top Item	Phantom Item	Long Lead Item	Under Operation	Cost
Jet1185-LN/A	In Work	2 Seater Jet Ski 2008s - New	Make		Yes	No	No		
RS-99-096-7T/A	Released	Rudder Base	Make	2	No	No	No		1000
Seat407-59-022/A	Released	Seat407	Make	1	No	No	No		1230
Jet109-887-99T/A	Released	Jet99-8	Make	1	No	No	No	49	
Jet109-879-07D/A	Released	High Thrust Water Jet Pump	Make	1	No	No	No	49	
H109-99-00/A	Released	Jet Holder	Make	1	No	No	No		
Cover188-88F/A	Released	Cover Shield	Make	1	No	No	No		
CC188-99-12F/A	Released	Jet Cover Connection	Make	1	No	No	No		
SR15-310/A	Released	Steering Bar	Make	2	No	No	No		
ISO 4014 BOLT M6	Released	ISO BOLT M6x65	Buy	1	No	No	No	45	
ISO 7089 WASHR	Released	ISO 7089 WASHR 16x30	Buy	1	No	No	No		
ISO 4032 NUT M16/A	Released	ISO 4032 NUT M16	Buy	1	No	No	No		
M98-09-45A/B/L/A	Released	Mirror x98 Left	Make	1	No	No	No		1000
M98-09-45A/B/R/A	Released	Mirror x98 Right	Make	1	No	No	No		1000
JetRC-4444-C/A	Released	Mini-Boat	Make	1	No	No	No		
Pack-2308/A	In Work	Packaging 2308	Buy	5	No	No	No		
Phantom-LN/A	In Work	K8 for Jet Ski 1185 LN	Make	2	No	Yes	No		

Name	Value
Find number	
Ballon Number	
Configuration View	Manufacturing BOM
Operation sequence	
State	Released
Creation Date	05/06/2008
Created by	Admin
Modified by	
Last modification date and time	
Description	
Effective from	
Effective until	
Quantity	1
Reference Designator	
Unit Effective Start	
Unit Effective End	
Unit of Measure	

Figure 5: An example of a Manufacturing BOM. Users can easily manipulate the BOM and personalize the data view.

In summary, SmarTeam Engineering Express achieves its results using the following carefully thought out and well integrated capabilities:

- Item and BOM management

- Product views management (Engineering BOM, Manufacturing BOM and more)
- Top down engineering, by starting with high level product definition
- Enhanced document management for importing and managing documents related to projects
- E-CAD data capture from EDA tools (electronic design automation)
- Pre-defined change management templates and release processes based on ENOVIA SmarTeam experiences with more than 6000 customers
- Standard components management
- Bi-directional ERP data exchange
- Extendibility based on customer needs
- Pre-configured solution with business process roles
- A natural growth path from SmarTeam Design Express, which provides Multi-CAD data management for CATIA, SolidWorks, AutoCAD, Inventor, Solid Edge and Pro/ENGINEER

To get started, SmarTeam Engineering Express offers a "Quick Start", out of the box packaging, implemented with a single install process, and bundles software together with key implementation services, allowing implementation in just weeks. The "Quick Start" includes an environment to create an on-the-fly, pre-configured, modular database, installation documents, training material, and a methodology guide learned from customer best practices.

## **Conclusions**

Taking a data management product to the step beyond design management is difficult. While design data includes the necessary parts and assemblies of the product, the design is often discipline dependent and not knowledgeable about the manufacturing processes required. Discipline dependent means that the designs from other than mechanical systems need to be incorporated into the final product. These typically include control systems and logic, electronics, and software. In my opinion, SmarTeam Engineering Express delivers on these needs with an economical, robust, quick-start scenario for item-centric PLM, including workflow processes, quickly extending collaborative benefits across engineering disciplines. It is part of a family offering from ENOVIA SmarTeam that includes Design Express, as well as the full SmarTeam offerings.

For the mid-size customer, SmarTeam has a unique position in the industry. It supports multiCAD systems from the major vendors. SmarTeam Engineering Express was specifically designed for mid-size customers, is highly CAD centric, supports collaboration both inside and outside an enterprise, manages items and BOMs particularly well, uses pre-defined best practices workflows, requires easy administration, easily expands to more PLM capabilities, such as standard compliance, supply chain management, implementation for multi-site organizations and more, can be rapidly installed, and can easily interface to any ERP system, such as SAP, Oracle, and others. Its primary competitors, Teamcenter Express and Windchill, both began life as large scale PLM systems and both retain some of their large scale heritage, meaning they are more difficult to install and operate than SmarTeam, are more difficult to customize, do not support the same level of out-of-the-box offering, EBOM synchronization, MBOM synchronization and more.

ENOVIA SmarTeam Engineering Express can deploy in just a few weeks, thus achieving rapid ROI. Users working with resellers can accelerate their implementation success by working closely with resellers to train their personnel.

Customers evidently are excited about the offerings. "ENOVIA SmarTeam has provided a system for managing, communicating, and integrating technical and business change. We have processed about 300% more changes with reduced effort, and reduced processing time on Make-to-Order products by 70%," said Jim Stewart, Engineering Systems Manager of Swagelok, a fluid system component manufacturer based in the United States.

Companies will find that they can, if they have the desire, adopt the necessary disciplines to properly install and manage such a system. Users today cannot afford to continue to use many of the antiquated engineering support systems that fail to deliver the engineering solutions that ENOVIA SmarTeam Engineering Express offers.

For more information on SmarTeam go to <http://www.3ds.com/products/enovia/mid-size-market/> .

## **About the author**

Raymond Kurland is president of TechniCom Group LLC and its principal consultant and editor. His firm specializes in analyzing MCAD and PLM systems and has been involved in reviewing and comparing such software since 1987. Ray frequently consults with both vendors and users. Dassault Systemes is a client of TechniCom's vendor program and provided indirect funding for this paper. Nevertheless, the impressions and conclusions are solely those of the author, an independent analyst and consultant in the MCAD industry. Ray can be reached at [rayk@technicom.com](mailto:rayk@technicom.com). For more information about TechniCom Group and other software reviews please visit [www.cad-portal.com](http://www.cad-portal.com) .

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