ENOVIA SmarTeam Visual ETO

CIMdata Commentary

Two main product realization business models are in common use today: Make-to-Stock and Engineer-to-Order (ETO). While each of these supports a viable business model and some companies use both, this commentary will concentrate on ETO. However, to set the stage, both models are outlined here. Make-to-Stock supports volume-based manufacturing of products based on standard designs. This type of product model works well for commodities such as fasteners, household tools and appliances, consumer goods, and many other products. ETO is the most flexible from the customer's perspective. Products in this model are designed in whole or in part to each customer's specifications. Elevators, chemical processing plants, and satellites are examples. While this can be a difficult process, ETO produces some important benefits:

- ETO allows highly-configured, specialized design solutions that satisfy specific customer needs.
- ETO can be used to design products that precisely meet customer specifications, requirements, and design expectations.
- Previous designs can be re-used and re-purposed, leveraging previous development efforts.
- Using a formal ETO process can reduce product development time and costs, especially for demanding customers.
- Using a formal set of product development and management processes to support ETO can reduce design errors and improve quality.
- By leveraging previous designs, ETO can increase innovation.

ETO is very important to customers who need a product to match particular operational requirements. Best-in-class ETO processes are characterized by re-engineering products for each customer and perhaps for each intended use within a customer. This re-engineering could be done by brute force, beginning each new product request as a totally new product design essentially starting from scratch, but that is not very efficient. ETO provides a more streamlined way to satisfy these customer demands:

- ETO-enabling solutions capture and track each customer's product specifications and requirements to assure that the customer gets the products they need.
- Customer and other requirements are managed in defined contexts (i.e., in PDM directly related to the particular product configuration they define).
- Requirements are versioned, secured, and tracked to improve quality.
- Requirements can be associated directly to design elements (e.g., in CAD).
- ETO allows existing baselined and modular designs to be customized and adapted to new requirements.
- ETO provides a user interface that integrates systems, configuration rules, models, and data that are relevant to a particular design.

Implementing an ETO business model is not a simple exercise for the company that is creating the product. For instance, even before a redesign of an existing product is begun, the company usually must respond to a bid request from the customer. Leveraging previous designs can have a large payoff in producing a winning bid quickly–a bid that meets the customer's requirements and cost expectations. However, it is not enough to just have a winning bid. The bid must also result in a project that can be profitable for the company. To achieve this, the bid should be based on accurate information from previous product projects. As described below, a number of technologies and processes can be brought to bear to help companies achieve a viable ETO business model.

Supporting an ETO Business Model

A profitable ETO strategy is made viable by employing a number of capabilities typically found in PLM-enabling solutions. These capabilities include the data and configuration management of all product designs so that they can be easily found and reused–not just to create the next design, but also to create a winning bid that will lead to a profitable product project. Support for collaboration is also required so that the people who need to create bids and new designs can work together to assure that the best possible solution is put forward as quickly as possible. It also provides a visualization capability that allows everyone who has to contribute to the solution to see and be able to analyze all of the data that is created without having to have access to complex CAD environments and other data creation tools. To support the ETO process, companies need to:

- Create a library of designs and modules that can be used as baselines.
- Efficiently (even automatically) capture functional and interface requirements from customers.
- Assure conformance with the customer's requirements and needs throughout the product creation process.
- Re-use existing designs to create product variations rapidly.
- Use data management and data visualization to support collaboration throughout the product development and manufacturing organizations.
- Use visual design data (2D and 3D) to accelerate decision-making.

Furthermore, to enable the ETO process companies need to:

- Identify and define product modules that can be searched easily to find products that can be adapted to new requirements.
- Document the purpose and use of base designs and special features that allow these to be adapted to new uses.
- Assure that products leverage duplicate, common, or standard functionality using modules to isolate aspects of designs that are most likely to change.
- Manage all data and configurations in PDM to facilitate rapid design and rapid communication to manufacturing.

ENOVIA SmarTeam's ETO Solution

ENOVIA® SmarTeam™ calls their ETO solution "Visual ETO" to stress its ability to leverage visual information to help streamline the ETO process. However, visualization is not the only capability of the Visual ETO solution. It also supports a collaborative Internet-enabled environment that allows globally-dispersed Visual ETO users to share, evaluate, and leverage product data using visual data as a common language. It can be integrated with

multiple CAD and other enterprise solutions. Its configuration capabilities support development of BOMs for manufacturing.

ENOVIA SmarTeam's Visual ETO solution provides a bridge between past product development efforts and future designs. It provides a data management repository that captures and retains intellectual value from previous product developments, and provides access to that knowledge in a form that product designers can adapt and re-use.

Requirements are an important part of the information that defines an ETO product. Visual ETO's data repository can track the customer's critical requirements in association with other product development data and allow developers to assure that each requirement is properly fulfilled.

Visual ETO's workflow engine is important to allowing engineers to link BOM configurations to the product development process. Workflow also helps automate change and approval processes, lessening the burden of frequent changes on the product development staff. Workflows can also be generated to ensure the quality of, and streamline transfer of information to manufacturing.

Visual ETO provides a 3D-viewable, common language format that enables collaboration across the entire product lifecycle. Collaboration reduces design iterations, which in turn shortens time to manufacturing. The ability to visually collaborate with customers can assure adherence to requirements and lead to better customer satisfaction. A number of benefits derive from the use of a solution like ENOVIA SmarTeam Visual ETO:

- ETO allows more product variants in shorter development cycles.
- Designers, systems engineers, and others involved in product development have a tool that they can use to manage the complex requirements and data required by customers.
- Intellectual property is captured and preserved so that companies have a base of knowledge that supports rapid development for current ETO customers and allows time for innovation.
- ETO allows companies to be more responsive to a customer's specific needs.

It is CIMdata's opinion that the ENOVIA SmarTeam Visual ETO solution enhances, complements, and extends the overall ETO product development process. It provides a platform for implementing and executing formal ETO processes that will help streamline ETO product development efforts.

About CIMdata

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