

ENGINEERING

ENOVIA Engineering Central



ENOVIA® Engineering Central™ addresses key global product development challenges by eliminating the significant process and data communication barriers that exist between mechanical, electronics, and software engineering disciplines within the enterprise and the product supply chain. With ENOVIA Engineering Central, companies can aggregate input from all design disciplines into a single enterprise-wide definition of the engineering bill-of-materials (EBOMs). All functions throughout the company access the same EBOM information resulting in improved innovation, decision making, quality, and process throughput.

Key Benefits

- Consolidate part design and related technical document content from multiple engineering tools by providing a single definition of the EBOM
- Increase product innovation through improved communication and collaboration with global development teams leveraging 3D visualization and electronic communication including email and ad-hoc workflow
- Leverage skills and knowledge of the enterprise and supply chain through institutionalization of cross-functional product development and engineering change processes
- Use analysis reports that quickly identify component usage, highlight differences between assemblies, and summarize design changes over time

Product Overview

Economic and competitive pressures are causing companies to rapidly transition to a global design and manufacturing business model. As technology evolves, products are becoming more complex and encompass more electronic and software content to differentiate them. Companies need to eliminate the significant process and data communication barriers that exist between mechanical, electronics, and software engineering disciplines within the enterprise and the product supply chain.

ENOVIA Engineering Central creates a competitive advantage by addressing key product development business challenges such as:

- Improved communication and collaboration with global development teams comprised of internal and external resources
- Part and EBOM management capabilities to provide a single enterprise-wide definition of software, electronic and mechanical product information
- Global product development and change processes that provide the right information to the right users at the right time
- Synchronization with design in-work progress for CATIA® and other CAD tools, and 3D visualization
- Reporting capabilities tailored to meet the needs of multiple functional areas such as change and EBOM management.

Product Highlights

ENOVIA Engineering Central provides a “single version of the truth” by consolidating and managing all the engineering data and processes in one enterprise solution. Key features and capabilities include:

Development Team Communication and Collaboration

Global teams comprised of internal and external resources need to share ideas and participate in development business processes globally. ENOVIA Engineering Central is built upon the ENOVIA platform, which provides collaboration capabilities including supplier security, formal and ad hoc process support, file sharing and distribution.

Part Management

ENOVIA Engineering Central provides part management capability for both development and production lifecycles for added process flexibility. Parts in ENOVIA Engineering Central can be identified by a unique auto-numbering scheme or by user-entered names. Part revisions can be created for managing the evolution of design and changes for an item if the current part number corresponds to a released part (e.g. tooling or production). Each new part revision must be form, fit, and function (“FFF”) compatible with all of its predecessors. “FFF” is a description of an item’s identifying characteristics as defined below:

- Form is the shape, size, dimensions, mass and/or other visual parameters which uniquely characterize an item. This defines the “look” of the part or item. Sometimes weight, balance and center of mass are considerations in ‘form’.
- Fit is the ability of an item to physically interface or interconnect with or become an integral part of another item or assembly. This relates to the associativity of the part in relation to the assembly, or to other parts, and includes tolerances.
- Function refers to the action[s] that an item is designed to perform. This is the reason for the item’s existence, which also includes secondary applications.

If the specifications or criteria, for form, fit and function of a particular item are met, all other attributes, from an engineering design process perspective are moot or extraneous. Interchangeability on an item in a system is mainly determined by physical, functional, and performance characteristics or specifications that uniquely identify a component or device.

Parts can be managed individually or included in a part family, which groups parts into logical families. Parts that are members of the same part family share similar characteristics. Parts within a family can be declared as a master or reference to determine how a common set of specifications is shared. An example could be a set of parts that have the same geometric shape but different colors. The CAD models can be defined once for the “master” part in the part family, and shared between the other “reference” parts in the part family. An auto-naming function allows parts in the family to be named similarly based on customer tailored rules.

Engineering Bill of Material Management

ENOVIA Engineering Central provides global development teams with a single, persistent definition of EBOMs. This reduces data errors and time delays. By defining the EBOM with parts of specific types, users can capture specific business behavior and attributes. Users can structure EBOMS for even the most complex products with thousands of parts organized across many levels of hierarchy. The EBOM assembly structure automatically updates when new component revisions are released. An integrated structure browser allows users to navigate and edit multiple levels easily. Users can create and add multiple new parts to an EBOM in one operation or add multiple, existing parts by search or explicitly entering the part name.

EBOM Editing

An intuitive EBOM markup tool allows users to markup, approve, and apply EBOM changes. Comprehensive EBOM editing capabilities include the ability to copy parts to and from existing assemblies, and replace, add, remove, and re-sequence parts in the EBOM. Differences between EBOMs can be listed in a detailed text format or an intuitive highlighted side-by-side format. Multilevel where used capabilities enable users to quickly determine affected items, raise change requests and perform complex mass change operations such as replace, add, remove or edit.

EBOM and ENOVIA® 3DLive™ Cross Highlighting

ENOVIA Engineering Central provides engineers and managers with an Engineering Bill of Material (EBOM) and 3D cross highlighting to visually experience a BOM structure in 3D and better plan design changes and/or downstream manufacturing processes. Scenarios include navigating ENOVIA® X-BOM, performing an ENOVIA X-BOM comparison side to side and identifying items affected by Engineering Change Orders (ECOs).

EBOM Data Packages

ENOVIA Engineering Central users can generate and download a “data package” of EBOM related data. The package of data files can be in either a Microsoft Windows or UNIX® ZIP file format. Users can specify BOM levels to include in the package, select specific documents for the package, download the package and store it in a workspace folder.

Preparing the EBOM for Manufacturing

ENOVIA Engineering Central supports preparation of an EBOM for manufacturing. Users can define the EBOM with location specific preferred suppliers and component parts and provide a list of engineering approved “alternate” or “substitute” parts that can be used by manufacturing instead of the primary engineering part. Purchasing can obtain a roll up of parts from a multi-level EBOM and execution systems can be automatically populated with EBOM data using optional ENOVIA integrations to most leading ERP systems.

Synchronization with Design Work-in-Progress and Visualization

ENOVIA Engineering Central works with ENOVIA® VPM Central™ and with ENOVIA® Designer Central™ in order to make CATIA® V6 and other CAD data available in the context of the EBOM. This provides consolidated document and EBOM views independent of the authoring tools used. Parts and assemblies can be visualized in ENOVIA Engineering Central with the 3DVIA® Viewer, which is available as part of the ENOVIA® Live Collaboration license. The user simply clicks on the 3DVIA Viewer icon from the EBOM page and a 3D image of the part will be displayed. Users can review the 3D image with functions such as rotate, zoom and panning.

Product Development Change Processes

ENOVIA Engineering Central is delivered with engineering “best practices” from the experience of some of the world’s largest manufacturing companies. These best practices enable standard and repeatable global engineering processes including an Engineering Change Request (ECR) process which is used to qualify, analyze, review and approve change requests for released parts, assemblies and technical documentation. The ECR process insures that a common process is followed and the right level of analysis and oversight is employed so that only “approved” changes are implemented thus reducing the quantity and time associated with implementing engineering changes.

The change process in ENOVIA Engineering Central supports a seamless process for initial release of a part and the associated specification(s) for production use and to manage and control subsequent changes to current approved part(s) or specification(s) at any point in the life cycle of the item. For any in-work objects (or data), the change is intrinsic to the specification/definition process.

In a typical product development cycle, the specification or the implementation of parts is likely to change during their development or integration. These design changes are commonly referred to as Engineering Change Orders (ECOs) and affect the functionality of a design after it has been wholly or partially completed. ECOs can compensate for design errors found during testing or changes that are made to the design specification to compensate for design problems in other areas.

ECOs enable the engineering best practice rules of FFF. If a proposed change is FFF compatible, the ECO-affected item will be revised. If a proposed change is not FFF compatible, a new part number should be used. A "mass replace" change capability is included in the ECO process to enable the replacement of an existing child part with a new part for all or selected affected parents when a part replacement is required to implement a FFF incompatible change.

In a typical product development lifecycle, the need for change is caused by, one or more of the following conditions:

- Correction of a design error that doesn't become evident until testing and modeling or until customer use reveals it
- A change in the customers' requirements necessitating the redesign of part of the product
- A change in material or manufacturing method. This can be caused by a lack of material availability, a change in vendor, or to compensate for a design error
- A proactive change initiated by design or engineering in order to modernize or enhance an existing design

ENOVIA Engineering Central provides flexibility to split one or many ECRs over one or many ECOs for implementation. The ECO process includes the ability to configure ECO approval and notification templates.

Reporting

ENOVIA Engineering Central has many standard reporting capabilities tailored to meet the needs of multiple functional areas. These reports provide valuable product information for cross functional groups to make informed and timely decisions thus contributing to overall product development and planning efficiency and quality. Reports can be formatted in a printer friendly format or exported to Excel.

BOM Reports: *Multi-Level EBOM*

Any number of EBOM levels can be expanded and included in the multi-level EBOM report.

BOM Comparison

This report improves part reuse and product quality by providing the ability to compare EBOM differences. The report has many comparison options including basis of comparison, attributes to display when a difference occurs, and BOM levels to compare. Results can be displayed in either a printer friendly table or in a graphical side by side format. If both ENOVIA Engineering Central and ENOVIA® X-BOM Manufacturing are implemented, users of each product can compare any combination of engineering or manufacturing BOMs.

Part Where Used

The "where used" report provides a part's single or multi-level parent usage, which is very useful in analyzing the scope and impact of engineering changes.

Consolidated EBOM

This report improves purchasing response time and reduces errors by providing a quantity roll up of parts from multiple levels of an EBOM.

Engineering Effectivity

The engineering effectivity report provides the ability to view an EBOM based on an historical date. This report enables the user to see the "effective" EBOM at a select date in the past.

Electronics Approved Vendor List (AVL) BOM

This report improves communication and reduces data errors internally and with electronic contract manufacturers by providing EBOM views and data packages with optional location specific preferred suppliers and component parts.

View EBOM in Expanded Format

The EBOM view can be “expanded” by displaying each reference designator value as a single EBOM record. This is particularly useful for consistently displaying electronic or location-specific items in the EBOM. For example, an EBOM record with a reference designator value of R1-R3 and a quantity value of 3 would be expanded to display three separate EBOM records with reference designator values R1, R2, R3 and with a quantity of 1 for each. The inverse view can also be calculated where an expanded view can be consolidated.

Change Process Reports: *ECR / ECO Summary Reports*

ECR / ECO summary reports are automatically generated and refreshed during the change process lifecycle and can be stored in HTML or PDF format. These reports provide a synopsis of the change so change board members can quickly review and approve complex pending changes.

ECR / ECO Metrics Report

These reports can be generated to capture lifecycle date and time metrics for ECR or ECOs. These reports are useful to determine trends in change process throughput.

ECR / ECO Late Approvals Report

Late approval reports provide engineering management with a list of change review or approval tasks that are late by the resource assigned. Late approval reports are useful to manage resource tasks and as input to resource load balancing.

Technical Document Management

Any document type, including Microsoft Office, can be managed independently or associated to parts. This improves interdepartment communication and company knowledge capture such as best practices and industry standards. Documents can be connected to parts, specifications or changes objects as reference documents or supporting documents as needed.

ERP Integrations

Customers can choose to extend their ENOVIA Engineering Central capabilities by licensing the following products to integrate seamlessly with leading ERP systems:

- ENOVIA® X-BOM for Oracle Manufacturing
- ENOVIA® X-BOM for SAP

When ENOVIA Engineering Central is used with the above ERP integrations, the ECO release process automatically updates the associated ERP system(s). This automatic synchronization process eliminates redundant, error-prone manual data entry.

The Role of ENOVIA V6 and PLM 2.0

ENOVIA Engineering Central supports PLM 2.0, product lifecycle management online for everyone, and the ENOVIA V6 values: global collaboration innovation, single PLM platform for intellectualproperty (IP) management, online creation and collaboration, ready to use PLM business processes, and lower cost of ownership.



Delivering Best-in-Class Products



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Virtual Planet



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Dashboard Intelligence



Digital Manufacturing



Social Innovation



Collaborative Innovation



3D Communication

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