

## ENOVIA Version 5

*Helping customers transform ideas into industry-leading solutions*



# Product Lifecycle Management

Product Lifecycle Management (PLM) is a powerful IBM e-business on demand enabler. It facilitates a strategic approach to creating and managing a company's product-related intellectual capital, from initial conception to retirement.

PLM improves the efficiency of product development processes and a company's capacity to use product-related information. This enables companies to make better business decisions and deliver greater value to customers. It also allows collaboration across organisational and geographic boundaries to improve supply chain communication, business process efficiency, and the ability to innovate.

Built on open industry-leading IBM middleware standards, PLM solution set components fit within any IT architecture to maximise the value of existing technical environments. The PLM solution set combines consulting, applications, services and infrastructure components to make a company's core business run smarter, smoother and faster.

## **A formidable combination**

By combining its integrated portfolio of PLM software, market-leading hardware and world-class consulting and services, IBM delivers the most comprehensive PLM solution for any business.

As the world leader in providing e-business solutions, IBM has been at the forefront of serving the needs of small and medium-sized businesses, as well as top Fortune 500 companies, for more than 21 years. The key to this success has been its ongoing strategic partnership with Dassault Systèmes, the developer of CATIA, ENOVIA, SMARTEAM and DELMIA—the products that lie at the heart of the IBM PLM solution set.

### **More than technology**

Using the collaborative power of the Internet, the PLM solution set allows organisations to make a quantum leap in innovative product design. It achieves this by reducing cycle times, streamlining development windows and cutting production costs all at the same time. PLM solutions optimise the product lifecycle environment and end-to-end processes with the help of the e-business and PLM technology and consulting services expertise of IBM, or its Business Partners.

To help realise the benefits of PLM, IBM also provides implementation, integration and operational support services, which include application management and business process outsourcing. To further underpin the PLM solution set, IBM can also add its industry-leading portfolio of hardware and services to your infrastructure. IBM @server and storage solutions, as well as middleware like WebSphere, WBI and DB2, can all be used as mission-critical components of a tailored PLM solution.

Like other IBM e-business on demand offerings, the PLM solution set links enterprise technology islands into a powerful network for nurturing new ideas. It breaks down the silos between different companies within your value chain, increasing the rate of information exchange and interaction between the people who drive a business forward.

# ENOVIA Solutions

ENOVIA Solutions provide e-business support across the development lifecycle of an enterprise's intellectual property. This includes product, process and resource data. The Solutions are integrated products that:

- *Encapsulate industry best practices*
- *Deliver 3D-based communication and collaboration tools*
- *Create business intelligence from product information*
- *Support the scalability necessary for extended enterprise deployment*
- *Federate existing applications with new ENOVIA Solutions to build a consistent and comprehensive information system.*

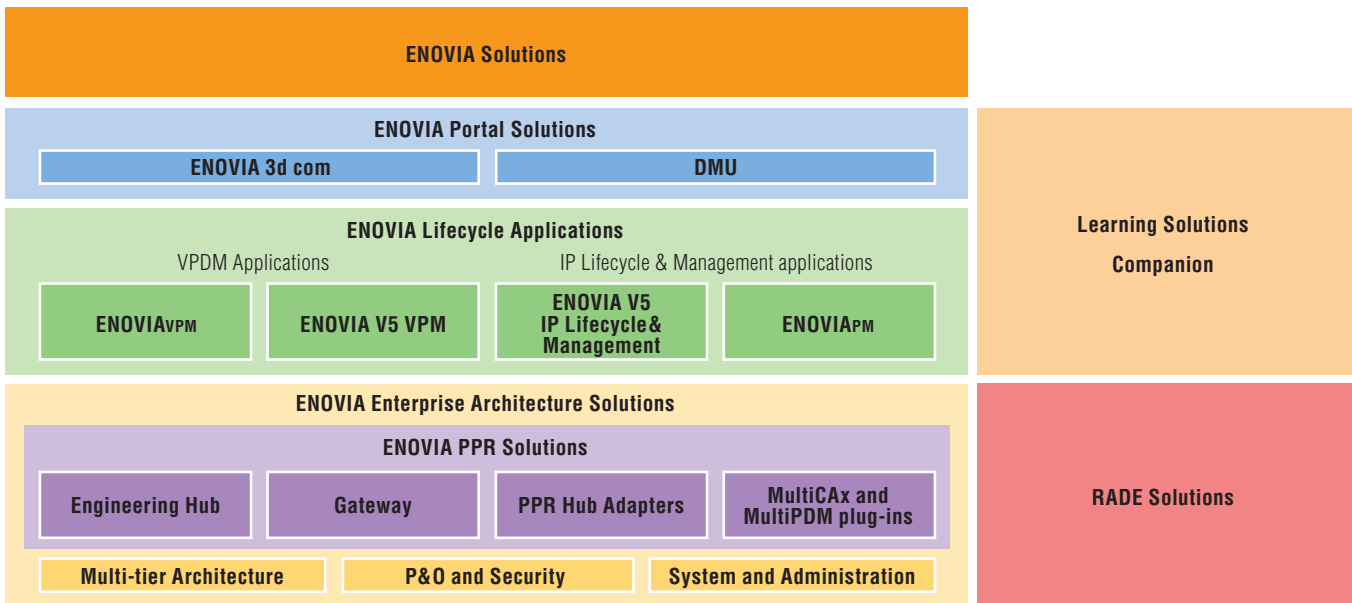
ENOVIA Solutions are a set of PLM products for the management and distribution of development data and knowledge – key elements of a company's intellectual property. Based on industry best practices, such as extensive use of 3D data, fast and reliable communications and enhanced collaboration, the products encourage optimisation of processes in the manufacturing enterprise and engineering supply chain. This ensures the satisfaction of end-user requirements and enhances innovation.

ENOVIA Solutions increase information sharing across the extended enterprise to enable shorter development times and higher product quality. This also provides 'right-first-time' design, not only of the product, but also of manufacturing and assembly tools and processes, service requirements and associated deliverables. Implementation of the 'digital enterprise' in this way, promotes innovative product and process definition, quickly transforming ideas into commercial products while simultaneously reducing time to market and cost of ownership.

ENOVIA Solutions are components of the total set of PLM Solutions presented by Dassault Systèmes. This set also includes the CATIA and DELMIA product lines. Built on a unique Product, Process, Resource (PPR) Hub, they facilitate the management, access and use of intellectual property accumulated during the product development process. Extensive use of unambiguous 3D product and process representations combine with analysis and simulation of the 'virtual enterprise' so that all participants in the digital enterprise can understand, participate and contribute throughout the development lifecycle. This optimises real enterprise investments and processes.

Key business benefits of ENOVIA Solutions include:

- **Accelerated time to market.** *Time to market can be transformed into a competitive weapon despite increasing product complexity. ENOVIA Solutions help engineering teams and other specialists manage multi-option products, provide access to the many support systems required for change propagation and control design-related outsourcing without increasing cycle times.*
- **Creation of new market opportunities.** *New product variants can be added without increasing manufacturing complexity or the number of option-specific components. For instance, part re-use across multiple product variants can be optimised for individual option sets. These can then be easily built and assessed for specific customer requirements or regional markets.*
- **Additional market share.** *Using right-first-time development engineering, supported by ENOVIA digital mock-up best practices, allows easy product ramp-up to full production. This increases market share, reduces manufacturing costs and ensures that design targets are met up front.*
- **Reduced costs in the extended enterprise.** *The e-business, sharing and distribution capabilities of ENOVIA Solutions support extensive collaboration across the design supply chain. Capabilities including standards-based data exchange, 3D Web manipulation, selective authorisations and large-scale distribution are used.*



With this new release of ENOVIA Solutions, IBM and Dassault Systèmes illustrate the scale of change that this PLM strategy brings to the manufacturing environment. Product development is the enterprise domain that creates the major part of a company's intellectual capital and is therefore most likely to affect both the top and bottom lines. Efficient exploitation of the intellectual capital in collaborative 3D-intensive best practices stimulates innovation and promotes product and process optimisation through inexpensive virtual reality simulation in place of today's costly "build it, cross-your-fingers, then correct it" approach.

The digital enterprise represents a seismic shift for enterprise priorities. As a result, companies are encouraged to focus on developing a roadmap. This roadmap will vary for each customer depending on a multitude of factors, ranging from specific environment conditions to particular best practices support. IBM and Dassault Systèmes are ready to assist with the development of this roadmap, leveraging combined experience and extensive product expertise.

ENOVIA implements its Digital Enterprise Vision through the delivery of solutions in five 'Foundation' families:

- The Portal Solutions Foundation** provides manufacturing industries with professional Webware and federation services for e-business decision support, including graphical visualisation, analysis and collaboration. It builds on the ease-of-use and scalability of the Internet to provide a unique 3D window to digital enterprise data from ENOVIA or legacy systems.
- The Life Cycle Applications Solutions Foundation** contains rich user-oriented functions that incorporate industry best practices. It manages intellectual property accumulated during the product lifecycle from initial specification through service and end-of-life requirements. Off-the-shelf, role-based applications allow rapid deployment across the entire enterprise.
- The PPR (Product-Process-Resource) Hub Solutions** manage business knowledge throughout the digital enterprise. They provide critical links between a product's definition, its manufacturing and service processes and the resources used to build and maintain it. Common data, configuration and workflow modelling functions also provide an essential core for efficient product development integration. The PPR Hub also acts as the integration platform (the 'enterprise gateway') for all enterprise development data whether it is stored in ENOVIA or a legacy system.
- The Enterprise Architecture Foundation** provides a scalable information system platform that adapts to any size of digital enterprise implementation, from few to many users. It implements industry standards and technologies that enable the system to adapt to changing enterprise boundaries.
- The RADE (Rapid Application Development Environment) Foundation** provides the application interfaces and tools needed to add enterprise-specific knowledge to the ENOVIA core solutions.



# ENOVIA Portal Solutions

## *Promoting collaboration and decision making*

The ENOVIA Portal is a line of scalable open collaborative Web and Windows®-based solutions designed for the digital enterprise. It adds general accessibility to the knowledge-rich digital information created during the product development process and makes product, process and resource information available throughout the extended enterprise, wherever it is stored. A wide variety of powerful, scalable ENOVIA Portal applications allow product and process designs to be viewed, simulated and evaluated in 3D.

In the new digital economy, product development information is a key asset for manufacturing companies. This allows them to provide the right information, to the right people, at the right time and in the right form. Only by succeeding in these four key areas will they enable fact-based decision support, promote fruitful collaboration and unambiguous team work and benefit from e-business implementation across the extended enterprise.

ENOVIA Portal Solution unifies access to information sources throughout the extended digital enterprise, comprising the PLM, CRM, SCM and ERP domains. Used in conjunction with optional PPR Hub multiPDM and multiCAx Plug-Ins, ENOVIA Portal Solutions provide access to, and visualisation of, data stored in multiple underlying systems such as legacy, files, CAx, Web and other data across the extended enterprise. This makes information available to all participants for enhanced decision support and collaboration.

ENOVIA Portal Solution generalises the use, manipulation and analysis of graphical data for enterprise decision support. Support for multi-source engineering design, manufacturing and service data also promotes multi-functional support and product/process optimisation. Display, analysis and simulation tools, including intuitive visualisation and navigation through a 3D product, are available to address the requirements of the beginner, as well as full, immersive analysis and simulation for the experienced user. It also provides a content service by including an 'Effects Library'. This comprises a compilation of scientific and engineering knowledge to drive the development process down the

knowledge-based innovation pathway. Value-added solutions on top of the base include a set of 3D Web visualisation and data management solutions, and an advanced Windows-compatible component for 2D and 3D DMU manipulation.

Key business benefits of ENOVIA Portal Solutions include:

- *Providing participants in the extended enterprise with access to the right information at the right time*
- *Promoting 3D as a key communication enabler*
- *Supporting collaboration across virtual teams*
- *Providing decision support in product development*
- *Promoting and enforcing best practices.*

ENOVIA Portal comprises two different families of products:

- **ENOVIA 3d com products** constitute the Web-enabled part of ENOVIA Portal Solutions. These provide users with transparent access to all information, applications or services in a customisable and intuitive user environment.
- **ENOVIA DMU products** provide a powerful collaborative design review environment through advanced plug-and-play Windows-compatible visualisation, navigation, review, analysis and simulation capabilities.

# Life Cycle Applications (LCA)

## *Creating and managing Intellectual Property*

ENOVIA Life Cycle Applications allow manufacturing companies to improve corporate performance by leveraging their most important asset – their product. The Life Cycle Application solutions help them create new markets by meeting market demands with innovative products while reducing development and manufacturing costs through flexible product development processes throughout the product lifecycle and across the extended enterprise.

The Life Cycle Application Solutions contains rich user-oriented functions that incorporate best practices from various manufacturing industries. These best practices, delivered as off-the-shelf applications, allow for rapid deployment across the entire enterprise, ensuring that customers achieve right-first-time implementation using proven methodologies.

Key business benefits brought by ENOVIA Life Cycle Applications include:

- *A single enterprise collaborative environment that enhances innovation and reduces time-to-market*
- *Intellectual property management that spans throughout product life cycle activities, from conception to end-of-life*
- *Collaborative business processes across the extended enterprise that allowing for more product development distribution to risk-sharing partners and multi-sites.*
- *Off-the-shelf best practices from all major manufacturing industries providing proven methodologies*
- *Improved flexibility with the ability to implement more options for your business model and structure with no artificial boundaries.*

ENOVIA Life Cycle Application Foundation is comprised of two domains, the VPDM (Virtual Product Development Management) and the IP (Intellectual Property) Life Cycle Management domains.

ENOVIAvPM and V5 VPM (Virtual Product Modelling), our solutions for the VPDM domain, provide manufacturing companies with a state-of-the-art virtual product development solution. They allow them to deliver innovative products that can be easily modeled in many variants to better meet market requirements without increasing manufacturing complexity.

ENOVIAIPM and V5 IP Life Cycle and Management, our solution for the IP Life Cycle & Management domain, provide a framework that allows all entities in the extended enterprise to collaborate fully in the development and management of an enterprise's intellectual property throughout its lifecycle, from conception to end-of-life.

# ENOVIA – PPR Hub Solutions

## *Capturing and organising Intellectual Property*

ENOVIA PPR Hub Solutions provide manufacturers with the ability to capture knowledge pertaining to the products being designed, the processes describing how to manufacture them, and the resources required. This knowledge, and the understanding of the relationships involved, helps to ensure that design changes are easily propagated to all affected items in the product development process.

The PPR Hub Solutions organise and manage the intellectual property gathered during the product lifecycle. The PPR Hub itself is delivered as three independent components – the Engineering HUB, the Manufacturing HUB and the forthcoming Enterprise HUB. These can be implemented together to deliver a seamless flow of PPR information throughout the enterprise.

The Engineering HUB organises product engineering knowledge (the first 'P' in PPR) to provide complete interoperability between the product design authoring tools and the product design management tools. This interoperability is enabled throughout Dassault Systèmes' line of product authoring and data management solutions including CATIA, ENOVIA LCA, ENOVIA<sub>vPM</sub>, ENOVIA<sub>APM</sub> and SMARTTEAM.

The Manufacturing HUB manages manufacturing engineering knowledge (the second 'P' along with the 'R' in PPR) to provide complete interoperability between DELMIA's digital manufacturing solutions.

Together, the Engineering HUB and Manufacturing HUB facilitate modelling the entire product lifecycle, from concept to end-of-life. Manufacturing constraints can be accounted for during the design process and engineering changes can be assessed by considering the downstream effects in manufacturing. The result is an enterprise that is better integrated, more responsive and capable of delivering higher quality products in a shorter period of time.

Enterprise integrations and connections into both the Engineering and Manufacturing HUBs are enabled through the Enterprise HUB. With this soon-to-be-released product, users will have the ability to connect non-Dassault Systèmes applications (SCM, ERP, CRM or legacy systems) with the PPR Hub for enterprise-wide information sharing and process integration purposes.

Key business benefits of the PPR Hub domain include:

- *Right-first-time design through persistent use of design in context that includes product, process and resource data.*
- *Accurate project and change planning through precise impact analysis navigation so that project planners are certain that all aspects of a potential change have been evaluated.*



# Enterprise Architecture Solutions

## *Providing Infrastructure for PLM Solutions*

- *Tight linkage to CATIA and other multi-CAX systems enabling a hybrid-modelling environment.*
- *Federation infrastructure to achieve unified access and business processes that can extend across diverse solution domains (PLM, CRM, SCM, etc).*
- *Open architecture using industry standards (C++, Java™, STEP...) allowing for the customisation of the PPR modellers to meet enterprise requirements.*
- *ENOVIA PPR Hub Solutions are composed of the PPR Hub product itself, a base infrastructure product called the PPR Hub Gateway and a set of optional hub adapters and Multi-CAX and Multi-PDM Plug-Ins.*

ENOVIA Enterprise Architecture Solutions consolidate architectural solutions for high performance transaction environments while satisfying the special requirements of 3D product lifecycle management.

ENOVIA Enterprise Architecture is an enabler that provides infrastructure components for PLM solutions including authoring applications (CAD, CAE, CAM ...), multi-tier, distributed applications and collaborative solutions. Its characteristics include:

- *Industry and de-facto standards such as STEP, Internet, UNIX™, Windows and JAVA.*
- *A high level of scalability capable of adapting to many different enterprise sizes and organisations.*
- *A transaction environment tuned to give users the response times they expect based on the complexity of their requests: short response times for trivial queries and acceptably longer times where the user makes high-function demands on the applications.*

- *Support for authoring environments involving very large data volumes, off-line creation and use of definition data such as CAD models, concurrent changes to very complex product definition elements and complex knowledge relationships between multiple product definition components.*
- *Ability to easily re-engineer system organisation and adapt it to rapidly changing engineering development organisations.*
- *Support for very large data volumes and management of persistence in a widely distributed environment through multi-file systems support and data replication capabilities.*
- *Strong security and authorisation mechanisms managed through a centralised user management application that can leverages enterprise LDAP services.*

# Learning Solutions

CATIA – Web-based Learning Solutions (WLS) is an easy-to-use learning and support system. It provides to all the required information and training in one source for maximum assured productivity of for the CATIA user community.

Also known as ‘the Companion’, it is designed to accompany the user so that it is ready to answer any query at any time. As such, the Companion is an essential tool allowing for the continuous enhancement of one’s skills and knowledge. This is crucial to ensure optimum on-the-job performance. By combining Internet and intranet standards with common client / server architecture, WLS can be deployed throughout an entire company or installed as a stand-alone application.

Some of the highlights include:

## **Extending your knowledge of ENOVIA anytime with an everyday ‘Companion’**

The Companion provides a set of learning resources, also known as ‘skillets’, which are carefully designed to acquire or enhance a given skill in a short timeframe and are commonly know as ‘skillets’. These skillets provide an interactive experience that includes different learning components such as ‘show me’, ‘do it’, ‘try it’ and ‘quiz’. The variety of components makes skillets highly adaptive to the user’s learning style and preferences.

Skillets can also be packaged as full courses that are equally as accessible via the Companion desktop. Among them, the course updates provided with each new release are an efficient way to keep the user community up-to-date with the new product capabilities, thereby ensuring in order to make the most efficient usage of CATIA.

The tracking mechanism and icon-based codification features allow the user to quickly select the most relevant component while maintaining a global view of learning resources. The Companion is configured with several collaborative tools such as frequently asked questions (FAQs), forums, and e-mail to access the support desk or tutor.

## **Customisation according to a company’s needs**

As companies have their own specifications, Companion Development Studio provides the capability to fully customise WLS products. Companion Studio is an intuitive, yet sophisticated environment that enables the development of integrated learning resources for ENOVIA. With Companion Development Studio, it is possible to develop and assemble brand new material while also reusing skillets delivered in the WLS products. It is therefore easy to quickly rearrange an existing WLS course to address more accurately the targeted population. It is also possible to add specific company information, such as procedures and best practices, to build a customised learning and user reference environment.



Companion Studio also promotes the development of reusable learning objects. These objects are based around a proven and robust instructional design model. Using a graphical interface, the designer can define a particular progression and then populate these objects using standard authoring tools, such as Microsoft® Word, FrontPage and PowerPoint, Macromedia Flash or DreamWeaver. It is also possible to use the specialised editors provided with Companion Studio to develop UNIX-compatible simulations and videos. As a rule, the Companion architecture is designed so that any HTML-compliant data used within a company can also be included in any Companion's learning object using Companion Studio. This feature ensures the compliance of generated data to Internet standards along with a fast evolutionary correlation to emerging standards.

## RADE solutions

Component Application Architecture (CAA) V5 and its Rapid Application Development Environment (RADE) enable users to integrate their know-how into specialised CATIA and ENOVIA applications. They also enable users to federate their existing legacy system into ENOVIA 3d com. CAA V5 is rapidly becoming the preferred development environment for companies wanting to grow the PLM solutions portfolio. Highlights of this product family include:

- *Open 3D PLM solutions ... These products build customised applications with more than 3000 component-based APIs across the range of PLM solution sets.*
- *Based on leading-edge V5 architecture... Customers can focus on innovation with powerful native capabilities, which are provided as standard components.*
- *Fully integrate 3D PLM products with V5 applications ... This solution set allows for the full integration of innovative applications into existing PLM products for extending the CATIA V5 product portfolio.*
- *Fast development capabilities ... The family includes tools that offer methods and guidelines for building stable applications, which are supported by the component-based architecture.*
- *Toolkits that are compliant with industry standards produce Windows and UNIX V5 applications ... This feature allows companies to profit from best-in-class development experience to cut development time.*



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