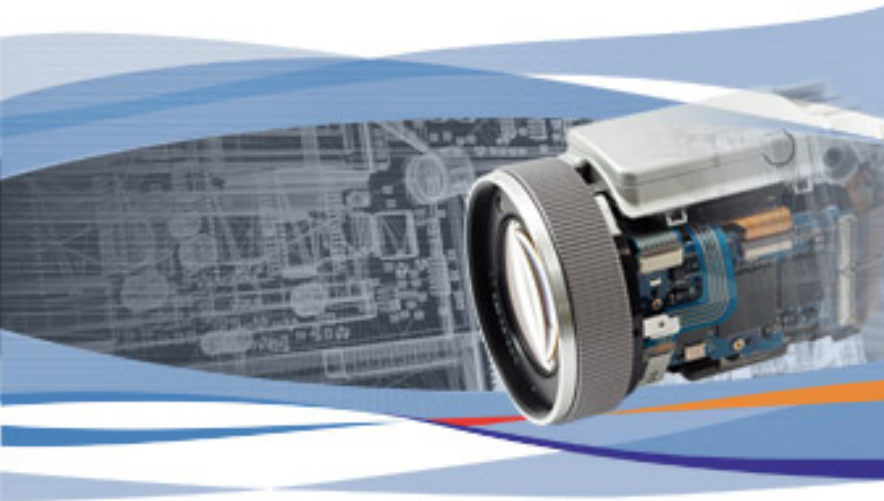


Collaborative Mechatronics Engineering

Mastering Multi-Discipline Design Complexity



Industry Business Drivers

No industrial sector has penetrated our way of life more than electronics. Electronics are becoming more and more pervasive as a common enabler across industry sectors and a key driver for innovation. Every day we discover that electronic systems have entered a new industry segment, driving the market differentiation of a new product. High-Tech and other companies that manufacture electronic components are facing top-level business drivers such as shorter product lifecycles, fewer resources, or the integration of global design, manufacturing, and test teams. Many High-Tech and electronic products such as cars, home appliances and medical devices are based on mechatronics, which is a design that blends mechanical, electronic, and embedded software components. Effectively incorporating the mechatronic systems into product design means overcoming formidable challenges related to data exchange

between various authoring tools and cultural barriers between different engineering disciplines. To face these challenges, High-Tech companies must master the product development process that facilitates cross disciplines collaboration and synchronization.

The Solution

As part of IBM's comprehensive V6 Product Lifecycle Management (PLM) solution, the Collaborative Mechatronics Engineering solution helps High-Tech organizations manage all mechatronic engineering activities, which begin with project specification and extend through to initial product planning. The solution provides a single repository for all product development data - ranging from specifications, 3D models, analysis results, to manufacturing requirements - in order that data can be securely accessed in real-time by relevant stakeholders. Mechanical, electrical and software data, which often have different lifecycles,

Highlights

- Provides dedicated design tools and the collaborative environment to improve cross discipline design efficiency
- Cross-discipline synchronization enables concurrent engineering across mechanical, electronic, and software domains
- Integration to most 3rd party design tools enables automatic capture and synchronization of product design data across engineering disciplines with varying authoring tools.
- Provides a single source of truth for all product development stakeholders by utilizing a unified product definition for all engineering data
- Real-time collaboration across the enterprise makes it easier to manage cross-discipline design evolution and change impacts
- Generates highly functional product designs within a shorter amount of time
- Minimizes costly late-cycle design issues and changes

are captured within a unified product definition to enable designers and engineers to employ a holistic approach to product design from the start of the project. The Collaborative Mechatronics Engineering solution fosters efficient design processes that take into account how well all mechanical and electronic components fit within the product enclosure parts since early in the development cycle so that costly late-cycle design issues can be minimized.

Coordinating engineering activities across stakeholders is a daunting task as pressures increase to meet complex product requirements and ambitious delivery target. Ongoing engineering changes can make it difficult to keep Bill of Materials (BOMs) and other product data synchronized across the supply chain. IBM's PLM system provides robust configuration management capabilities that are advanced through intense research and development activities in various complex manufacturing industries. This enables High-Tech companies to easily manage alternate designs or maximize design re-use across products. Workflows and shared part catalogs are also available to enable changes to be rapidly communicated to related stakeholders.

The Collaborative Mechatronics Engineering solution offers a rich set of design tools for components that are unique to the High-Tech industry. For instance, state-of-the-art modeling tools for defining the 3D shape of rigid and flexible Printed Circuit Board (PCB) are provided. Having various components defined within a single product definition allows for efficient design iterations to occur, thereby ensuring that all components are designed for optimum fit within constraint spaces typical in High-Tech or electronic products. The result is highly functional and efficient product designs that can be generated rapidly.

As High-Tech companies often need to bring in teams from multiple geographical locations and the supply chain, there is a need to accommodate multiple CAD (Computer Aided Design) and other authoring tools. Multi-CAD support is built into the Collaborative Mechatronics Engineering solution so that teams can freely review and exchange data while tracking changes and configurations across multiple authoring tools.

These capabilities are available through various connectors that connect the IBM PLM solution with a broad range of mechanical CAD tools such as CATIA, AutoCAD, Inventor, NX, Pro/Engineer, SolidWorks, as well as various electrical/electronic CAD tools such as Mentor Graphics, Cadence, and Zuken as well as software development tools such as IBM Rational ClearCase. The tight integrations reduce errors associated with poor collaboration and hand-offs.

The Collaborative Mechatronics Engineering solution integrates the following sub-processes:

- Embedded Software Engineering
- Rigid and Flexible PCB Engineering
- Electrical Engineering
- Electro-Mechanical Engineering
- Engineering Technical Documentation

The Collaborative Mechatronics Engineering solution is supported by the following products:

- ENOVIA® VPM Central™
- ENOVIA® Designer Central™
- ENOVIA® Designer Central™ for CATIA® V5
- ENOVIA® Engineering Central™
- ENOVIA® Library Central™
- ENOVIA® Collaborative Design for Multi-CAX (Inventor, Pro/ENGINEER, NX, AutoCAD, SolidWorks, Cadence, Mentor Graphics, Zuken, etc.)
- ENOVIA® Live Collaboration
- ENOVIA® X-BOM for Rational ClearCase
- Various CATIA® products for mechanical and electronic design

This solution may also be completed by :

- IBM Rational ClearCase and IBM Rational ClearQuest



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