SIEMENS

Ingenuity for life

Design data management and simulation management

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Benefits

- Accelerate new product introduction schedules
- Transform disconnected tools and processes into an integrated design solution
- Facilitate environmental compliance and manufacturing standards
- Share data across domains to deliver higher quality products
- Leverage virtual prototyping to increase product reliability
- Identify downstream issues earlier to reduce scrap and rework
- Manage hardware/software dependencies to reduce warranty costs
- Navigate multi-domain relationships to identify all product data impacted by a change

Summary

Teamcenter® software's suite of design data management and simulation management solutions enables you to establish a collaborative environment for developing products comprised of mechanical, electronic, software and control (electrical interconnect) technologies. Leveraging best-in-class tools, a common data model that crosses multiple engineering domains and an integrated product lifecycle management (PLM) and application lifecycle management (ALM) framework that manages the entire lifecycle process, these solutions enable domain-specific teams to retain their mechanical, electrical, electronic or software focus while working together to meet overall product development goals.

Managing your mechanical, software, electronic and electrical interconnect lifecycles

Complex software-driven electronics play a major role in many products' most advanced features. To address the product development issues that arise from these complexities, the integrated Teamcenter for PLM and Polarion™ for ALM solution facilitates a collaborative environment that enables disparate engineering disciplines to work together as they develop products comprised of multiple mechanical, electronic, software and electric interconnect components.

The integrated PLM-ALM solution's collaborative framework enables you to manage all of the design data created by these engineering domains while allowing development groups and suppliers alike to share and exchange this data. Just as importantly, the suite supports all of the tools and processes you leverage to develop these complex products across a complete product lifecycle.

Linked data framework

Teamcenter and Polarion ALM provides your design teams with a secure environment that manages product information and development processes across all domains. The linked data framework as well as support for industry-standard interface formats enable

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Business challenges

- Managing product development across a global supply chain
- Ensuring that all design teams access accurate information
- Managing product complexity resulting from the increasing use of software-driven electronics
- Meeting environmental regulations
- Integrating design data, tools and processes across domains
- Defining and managing software and hardware dependencies
- Managing thousands of software configuration and calibration parameters
- Facilitating cross-domain collaboration and product optimization
- Improving product quality and reliability
- Reducing rework, scrap and cost
- Tracing design implementation to product requirements

Features

- Secure, single source of product and process knowledge
- Integration with ECAD design tools
- Part library management
- Integration with MCAD design tools
- Integration with cross-domain simulation and analysis tools
- Electronics manufacturing assembly/test analysis
- ECAD design data viewing, cross-probing and annotation
- Software lifecycle support
- ALM/PLM interoperability
- Hardware/software dependency management
- Manage signals, calibration and configuration parameters, source code, binaries, libraries and build files
- Electrical interconnect lifecycle support

widely dispersed design teams to view, manage and share data with other members of the product team.

The integrated PLM-ALM environment enables product manufacturers to reduce or eliminate product quality and reliability issues by defining and managing the relationships and dependencies between all of the parts, options and variants in the product structure. These relationships and dependencies enable team members to rapidly identify what cross-domain data and processes are impacted when changes are proposed.

Providing widely dispersed design teams access to the right information at the right time, the integrated PLM-ALM environment minimizes development delays caused by lengthy information searches or incorrect data versions.

Best-in-class tools and integrations

In conventional settings, even though product development takes place on a global scale, design teams tend to work in isolation using multiple toolsets from a variety of vendors. By combining your current tools with the integrated PLM-ALM environment best-in-class applications, you can transform otherwise disconnected tools and processes into an integrated design solution that enables you to lower costs and improve quality, while increasing design productivity.

Mechanical design integration

Teamcenter supports today's most highly prized MCAD tools including NX™ software, CATIA, Pro/ENGINEER, SolidWorks, Solid Edge® software and Inventor. By facilitating multi-CAD supply chain design, Teamcenter's integrated development environment enables designers to work with model elements from other applications and share data across multiple domains.

Electronics design integration

Teamcenter enables ECAD teams to increase productivity by integrating disconnected design flows, managing all of your design, fabrication and assembly data and enabling you to share data across multiple domains. In addition, it supports ECAD integrations with design tools from Mentor, Cadence and Altium. It also provides an integration gateway to enable you to integrate tools that you develop internally or procure from other third parties.

To help reduce product cost and facilitate environmental compliance, Teamcenter enables you to leverage your ECAD part library and make it available for use across multiple ECAD tools. Just as importantly, you can use Teamcenter to manage your parts and modify their attributes – as well as control project access – on an enterprise basis. By managing data in Teamcenter, you can reduce part duplication, prevent the use of obsolete or unapproved parts, assign compliance data attributes and focus procurement from approved vendors.

Software design integration

The integration of Teamcenter and Polarion ALM enables you to manage, link and control your software development assets to the other parts of you products. Equally important, Teamcenter provides best-in-class support for signal/message management, calibration and configuration parameter management, as well as software design component management (IP libraries, specifications, test, documentation, built files, etc.) and software binary management.

These Teamcenter and Polarion ALM capabilities allow design teams to view and access the software configuration process, define and track thousands of generated signals, create and account for tens of thousands of software configuration and calibration parameters that control product performance and manage all dependencies that exist between software components, software to hardware components (processors) and hardware to hardware components. Teamcenter also enables product teams to treat these software components as a "part" in your product

definition and configuration processes. By tracking and managing software as a "part," design teams can lower warranty and repair cost.

Wire harness design integration
Teamcenter integrates with third-party solutions such as EPLAN Electric P8, Mentor Graphics' Capital Harness and Zukens E3 series. The wire harness physical design process is supported using Siemens PLM Software's NX design system and its NX Electrical Routing solution. The integration framework enables other third-party tools to be integrated as well.

Using a data model based on various aspects of STEP AP203, AP214, AP210, AP212 and KBL, Teamcenter transfers, stores and manages all of your logical design, physical design and BOM data. Teamcenter's wire harness data model enables design teams to define and manage wire harnesses employing multiple configuration options and variants from a single wire harness design. This robust data management capability enables design teams to improve design efficiency and reduce scrap.

Cross-domain design collaboration
Teamcenter facilitates greater design collaboration within and across domains. By leveraging Teamcenter's linked data framework, robust collaboration toolsets and data exchange formats, different domains are better able to communicate and document the specific nature of cross-domain design issues that you need to address.

Leveraging IDX (Incremental Data eXchange) and IDF (Intermediate Data Format) the Teamcenter PCB.Xchange capabilities enable your electronics and mechanical design teams to quickly and easily collaborate and share data. Mechanical engineers can share printed circuit board (PCB) configuration and design constraint information with electrical engineers. Electrical engineers can pass 2.5D/3D information to mechanical engineers so they can perform various simulation and analysis functions, such as evaluating interferences, thermal, vibration, shock, dust and humidity conditions. By enabling design teams to share analysis data in a virtual world, Teamcenter reduces your need for physical prototypes, shortens your development cycle and cuts your development costs.

Teamcenter provides advanced design for-assembly/test analysis tools that enable your design teams to analyze PCB layouts against a host of manufacturing rules early in the design process. By providing more than 50 user-configurable rules, Teamcenter enables your design teams to edit rule parameters, as well as selectively turn rules on and off. Teamcenter-generated analysis reports provide detailed insight into potential issues that might otherwise negatively affect manufacturing throughput or cost.

Widely dispersed design teams and their suppliers can employ Teamcenter's ECAD visualization tools to share data and identify design issues even when they use different ECAD toolsets. Team members and suppliers can use Teamcenter's ECAD viewer to browse, highlight and investigate design or manufacturing issues without the use of an expensive authoring tool. Powerful features for cross-probing between the schematic and PCB layout enable electrical engineers and PCB layout designers to communicate design intent and identify potential issues.

In addition to viewing data, designers or suppliers can graphically compare and mark-up the design with notes and annotations. Teamcenter automatically translates and displays many frequently used annotations – such as "traces too narrow for the power they will carry" or "object blocking solder wave" – using the language specified by the user's system. By performing this level of collaboration early in the process, you can reduce scrap and rework.

Leveraging PLM for mechatronics design associativity
The integration of Siemens PLM software's Teamcenter and Polarion ALM facilitate cross-domain associativity. Teamcenter provides a shared view of the product that breaks down the geographical, organizational and technological barriers between engineering domains while increasing your potential for design re-use. Design associativity enables design teams to define, search, visualize and navigate relationships, interactions and dependencies between data elements across multiple domains.

These connections and dependencies also enable product teams to locate and identify relevant data for any product or variant, as well as identify what other parts of the product and its schedule will be impacted by a proposed change. This level of traceability improves product quality and test coverage while eliminating feature creep and unnecessary rework.

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