SIEMENS

Siemens PLM Software

Teamcenter document management

White Paper

Enhancing document management in the product development process
Teamcenter® software provides powerful document management capabilities that operate within the product lifecycle management (PLM) environment, enabling you to use documents to support product information and processes. These capabilities are provided out-of-the-box to support product development knowledge workers. Unlike legacy and standalone document management applications, documents that are managed in Teamcenter directly reference and are influenced by, or are dependent on the product data they support and describe. PLM capabilities can be applied to documents throughout the workflow, review and signoff. Templates provide for quality and standardization as well as schedules for document deliverables, all synchronized with product development needs and drivers. This helps enhance user productivity and eliminates time wasted moving into and out of discrete applications.

www.siemens.com/plm

Contents

Executive summary

For decades, pundits have trumpeted the promise of a paperless society. They forecast far fewer dead trees, and an end to the headaches – and costs – inherent in the printing, distribution and filing of paper documents.

Skeptics will rightly point out that paper is still very much with us. Yet, the paperless society was always something of a misnomer. It was really all about unlocking the information trapped in all those discrete pieces of paper, and making that information more widely available in digital form. No longer locked away in file cabinets and desk drawers, modern digital documents have unleashed the value of intellectual property that can now be authored, shared, reviewed, revised, disseminated, stored, retrieved and leveraged by knowledge workers throughout the global enterprise.

Yesterday's pieces of paper are today's business objects, requiring:

- Authoring standards and templates that save time and effort while ensuring consistency throughout the organization
- Neutral file formats anyone can view without the native authoring software
- Access rules to limit which users have permission to read only, markup, change or print documents
- Version and revision control to ensure that the released document is fully vetted and up to date
- Routing and tracking protocols to control the document development workflow

The proliferation of digital documents in a variety of formats, such as Microsoft Office files, PDFs, computer-aided design (CAD) files, etc. has led to a new set of headaches. Coping with these digital mountains of information and being able to find and re-use the knowledge contained in specific documents is the challenge of document management. A document management system (DMS) is a computer system (or set of computer programs) used to track and store electronic documents and/or images of paper documents. Teamcenter can be used to address document management within the context of the product development lifecycle. For Teamcenter, document management is core functionality, thus making it integral to the PLM environment.

What's more, Teamcenter provides you with the ability to link documents to the product, as well as insert product data into documents. When an engineering change is made to the product, you can trace all the documents that are affected by that change, and update them accordingly. This ability is crucial during the product development process as well as after a product has been released to the marketplace. If the documentation needs to be examined for regulatory purposes, for example, knowing which documents are related to a specific configuration of a product or the date range of effectivity could prove to be quite valuable.

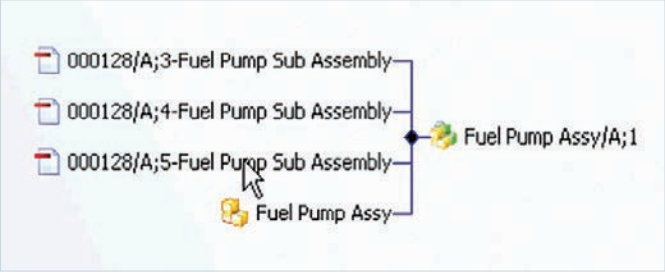
This white paper explores the utility and value of document management with Teamcenter.

Document management in the context of product development

Document management is crucial for product data management. Being able to quickly locate and view a given document is often the difference between productivity and frustration. Ensuring you have the correct version is critical. Would you rather have your highly trained engineers concentrate on engineering work, or wasting time wading through directories or electronic libraries trying to locate documents? But beyond engineers, there is also a population of knowledge workers who create documents that are associated with the product development lifecycle. Marketing creates documents that formulate product planning, market needs and sales collateral. Procurement creates specification sheets, request for proposals (RFPs) and contracts that reference product information. If you consider the various knowledge workers who generate documents that depend on product information or that contribute to the product lifecycle, your population of document authors grows beyond engineering and the benefit of a PLM-based document management system multiples.

Commercial standalone document management systems are available to control knowledge, content, digital assets or even web objects. Such systems include, at a minimum:

- A database or repository for storage and organization, including metadata about the objects stored
- Workflow and version management to track the development and maturity of documents
- The ability to manage access to the objects



Relationships between documentation and products/parts, including version effectivities, are viewable in the Teamcenter impact analysis viewer.

Yet a document management system that is integrated into a PLM system such as Teamcenter provides the ability to make the most of this data within the context of product development. Document management in context (and the data it describes) enables you to avoid wasted effort, costs and redundancies in documentation. This data is related, stored and integrated within the product development process, not isolated in a standalone document manager.

This enables you to find relevant product data quickly and re-use it effectively. Changes and processes remain linked to the documents, helping ensure that projects stay on schedule and that data quality is maintained at all times.

Consider the benefits to be derived from providing instant access to accurate, up-to-date information contained in such diverse document types as:

- CAD drawings of current and discontinued products
- PowerPoint presentations explaining market dynamics
- Meeting notes from a product release discussion
- Cutaway view illustrations of subassemblies
- Flash file movies demonstrating functionality
- Scanned photographs
- Annotated diagrams, flowcharts, maps and more

Having such information at your fingertips enables you to uncover what was done in the past, learn how and why decisions were made and leverage that information in new or improved products.

With Teamcenter, you can provide templates to end users, empowering them to create their own documents with a standard look and feel that are consistent with related documents. This also makes it easier for users to use the applicable boilerplate content, or predefined text that must remain static across all documents. This not only saves time, but also ensures you maintain compliance with legal, regulatory and/or instructional requirements. Commonly required metadata or properties for documents can be defined as a list of valid values to ensure consistent taxonomy.

Another key advantage provided by Teamcenter is the ability to render content in neutral formats. Instead of needing a license for Adobe Illustrator to view an .ai file, Teamcenter automatically renders it as a PDF and users can simply view it with Adobe Reader, a free utility. PDFs viewed in Adobe Reader can't be edited, which means you can use these documents to share information in read-only form and prevent the introduction of inadvertent or time-consuming changes that need to be reworked. You can also share neutral formatted documents with customers and partners without disclosing proprietary intellectual property such as CAD details, while still supplying interactive 3D and 2D illustrations and related parts information. These documents can also be digitally signed within Teamcenter to confirm authenticity.

Keeping documents under control

Documents are business objects and, as such, must behave consistently and in a controlled manner, depending on the type of document and how they drive or support business processes. Control in this context refers to important issues such as revision/version control. As documents are revised, changed and updated, you need to be sure that the latest revision is complete and accurate and that all related documents that are affected by any change are easy to find and update. Access management is also crucial from a control standpoint, including the ability to route/track documents by workflow and enable access to those with the right to view or modify documents at various states during development based on their role in the organization. While basic control across all documents may be the same, not all documents are the same and will have different behaviors. Certain documents may use specific templates; they may be rendered to neutral formats at different times in the lifecycle; and they may have different status at different steps, requiring different access controls.

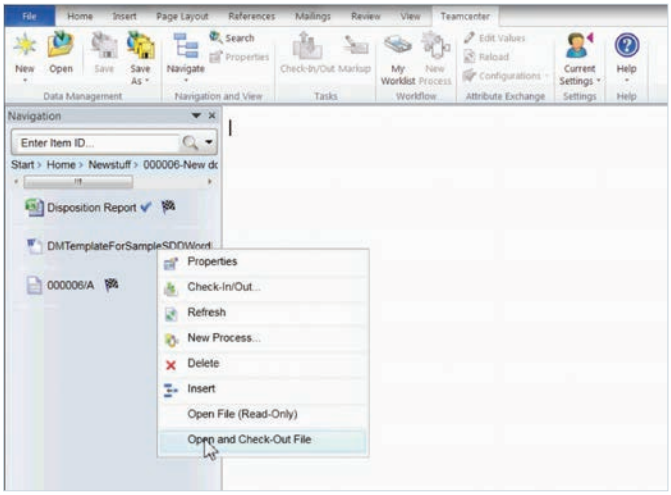
Further, the data created by an organization should be able to be captured at the point of creation and throughout its history with minimal effort by the users creating the data.

To that end, the Teamcenter document management system provides the ability to:

- Incorporate metadata describing each document
- Integrate documents into Teamcenter
- Capture, index, store and retrieve documents
- Maintain document security for access, change or deletion
- Support workflow
- Enable collaboration
- Maintain version control
- Support searches
- Control publishing
- Empower the repurposing of documents
- Digitally sign both the page and objects being managed in Teamcenter

Leveraging Microsoft Office files

Documents created with Microsoft Office applications can easily and efficiently be used within either the Office application or the Teamcenter environment. Office is one of the most widely-used application suites by Teamcenter customers. Embedding Teamcenter into Microsoft Office applications allows users access to Teamcenter data from within the application – exposing Teamcenter relationships, navigation and other functionality with all Teamcenter access and workflow management in effect.



The user can navigate Teamcenter information and directly access functionality from the Teamcenter tab in the Microsoft Office application.

The Office client also supports the re-use of data between different Office files – either by links or by embedding data. This interface provides easy-to-learn-and-use document-management functionality in Teamcenter for non-PLM users, enabling them to work in a familiar environment they know and understand – the Office suite of applications, including Excel, Outlook, PowerPoint and Word.

Not all users need to be immersed in PLM terminology and practices, yet because of the close Teamcenter integration with Office applications, everyone involved in the development process can contribute to product development by working with Word documents, PowerPoint slides and Excel files. System administrators can create templates and naming conventions, list values for document attributes and more to simplify end user efforts, thereby increasing the value of such documents.

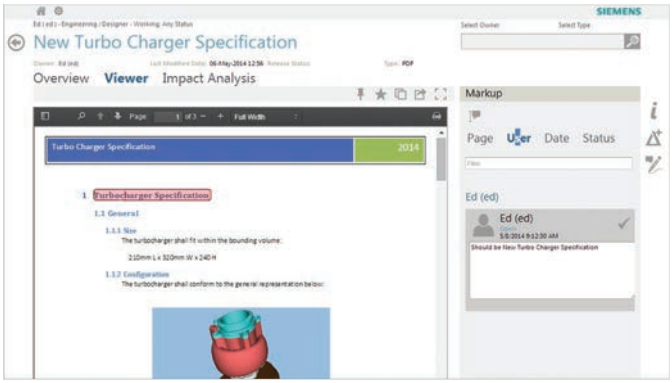
Commenting on documents

Teamcenter allows you to manage the markup of Office documents as well as PDFs. Microsoft Office and PDF files can be routed through a workflow. Multiple users can concurrently add and delete comments, modify comment text and types, and view others' comments without having to wait for those who have checked out the same file to check it back in. The document can also be sent out for review externally and then checked back into the system. Reviewer comments can then be managed within Teamcenter by the author.

You can revise your document according to reviewer comments as well as manage markups from external vendors or sources. Markups retain the integrity of the original document while allowing reviewers to comment.

Comments are managed in Teamcenter as separate objects, related to the original file being reviewed. In Teamcenter, the ability to generate a report, including disposition of the reviewers' comments, is available in the Microsoft Office document. Clicking the report button creates a related file in Excel, which contains each comment in the Word file, who made it and when, as well as how the original author responded to those comments, allowing you to retain comment and markup trails to meet internal and regulatory requirements for retention history.

Additionally, with a Teamcenter Active Workspace document, annotation and graphic markups can be made on PDF files from a browser on a web device.

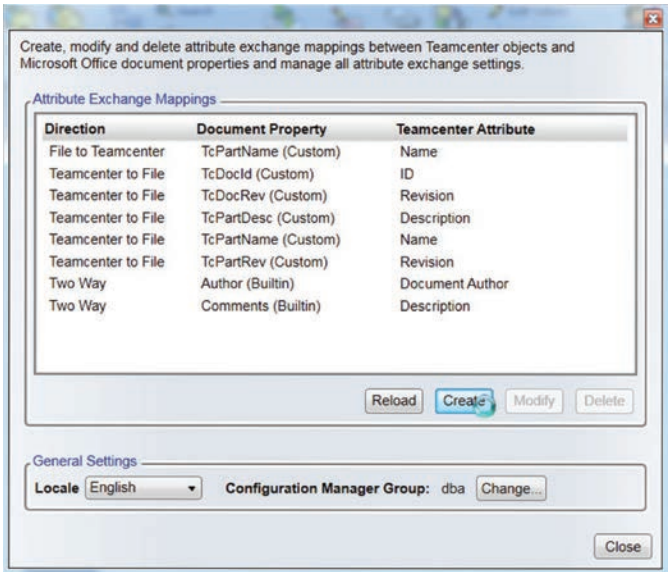


With Active Workspace, reviewers can markup documents directly from a browser-enabled device to accomplish tasks anywhere.

Consistent and accurate metadata

Teamcenter provides attribute exchange for Microsoft Office files, enabling you to update property information in Teamcenter or in Microsoft Office fields and properties within the document. You only enter the data once from a single location. Eliminating the reentry of data means less work for your users plus improved content quality and consistency.

The exchange supports formal, administrator defined property exchange and user ad hoc property/attribute exchange. You can move Teamcenter attributes to the file properties, file properties to Teamcenter, or make sure each is synchronized regardless of where the change originated. This exchange enables prepopulated templates to enable users to rapidly create their documents. It allows for parts information to be automatically populated in documents based on Teamcenter relationships to the template. It provides the ability to automatically capture and update author or revision information based on workflow states and authors.



Teamcenter attribute exchange mappings support bi-directional exchange of information between documents and Teamcenter to reduce input errors and extra work for authors.

Print management

The dreams of a paperless society notwithstanding, printing continues to be a part of everyday life. You can print individual or batches of files from the Teamcenter interface without opening the files. You can also add stamps in the form of footers, headers or banners, as well as simulated watermarks. Typically screened across each page, such watermarks make it clear that the document is confidential, a draft, etc. Distribution statements related to specific revisions, groups or projects can be added automatically.

Digital rights management

Digital rights management (DRM) is a major concern for many companies. DRM protects intellectual property starting with the development of documents throughout their usage and as they are archived. DRM can also provide additional access control to files while in a proprietary application such as Microsoft or Adobe Acrobat.

Teamcenter has partnered with commercial vendors to provide DRM. These applications are separately licensed at the enterprise level – not to individual users – and protect email and data stored in file servers and repositories as well as data exported from the system.

Siemens PLM Software partners with Microsoft for their active directory rights management services to protect Office, Sharepoint, Outlook, as well as Teamcenter community files. Another partner, NextLabs, provides DRM support for files in PDF, the JT™ data format, TIFF and other formats, as well as files from third-party CAD/computer-aided manufacturing (CAM)/ computer-aided engineering (CAE) software systems.

Supporting business processes

Teamcenter can be used to integrate with other business systems using web services and can route documents back and forth using workflow to send product information and documents at the right time to improve business processes beyond engineering.

Marketing teams can capture part information from Teamcenter, create product data sheets that incorporate illustrations directly from the design environment, and relate them to the product they describe. With Teamcenter notification and subscription capabilities, marketing becomes aware of updates to the product as they occur, and can have product sheets updated and ready to go with minimal effort. Versioning and access are all maintained with Teamcenter as the product and the accompanying marketing documentation are developed, released and updated together.

With Teamcenter, documentation created to support the product design and development process by nonengineers, or technical and training documentation to describe and document the product by technical writers and other departments can be versioned, reviewed and annotated, printed, released and kept in sync with product information.

Utilizing Active Workspace, knowledge workers can search and access documents anywhere, anytime from a web device with an intuitive user interface. Users can navigate to documents from parts or related documents and perform reviews and signoffs without being deskbound.

Teamcenter also provides optional functionality to integrate your documents and product information with enterprise resource planning systems (ERP), including SAP and Oracle, and exchanging data and documents between the Teamcenter and ERP environments. For example, the integration with SAP is a bi-directional interface between the Teamcenter system and SAP's ERP system that provides for handling product information, including documents pertinent to other business processes outside of product engineering.

Conclusion

Teamcenter provides robust functionality for digital document management within the context of product development. Teamcenter makes it easy for you to archive and retrieve documents, and provide them in neutral format under access control. Documents built in Microsoft Office are fully supported, making this familiar document environment a comfortable medium for product development work. DRM is fully supported, and the system can be integrated closely with major ERP systems. Teamcenter document management reduces wasted efforts, costs and redundancies in documentation by storing and relating documentation to the product data and allowing that data to be re-used easily and efficiently. Documents and products stay linked and in sync with engineering changes and processes to help ensure schedules are met and quality is maintained throughout.

Siemens PLM Software

Headquarters
Granite Park One
5800 Granite Parkway
Suite 600
Plano, TX 75024
USA
+1 972 987 3000

Americas
Granite Park One
5800 Granite Parkway
Suite 600
Plano, TX 75024
USA
+1 314 264 8499

Europe
Stephenson House
Sir William Siemens Square
Frimley, Camberley
Surrey, GU16 8QD
+44 (0) 1276 413200

Asia-Pacific
Suites 4301-4302, 43/F
AIA Kowloon Tower, Landmark East
100 How Ming Street
Kwun Tong, Kowloon
Hong Kong
+852 2230 3308

About Siemens PLM Software

Siemens PLM Software, a business unit of the Siemens Digital Factory Division, is a world-leading provider of product lifecycle management (PLM) software, systems and services with nine million licensed seats and 77,000 customers worldwide. Headquartered in Plano, Texas, Siemens PLM Software helps thousands of companies make great products by optimizing their lifecycle processes, from planning and development through manufacturing and support. Our HD-PLM vision is to give everyone involved in making a product the information they need, when they need it, to make the smartest decisions. For more information on Siemens PLM Software products and services, visit www.siemens.com/plm.

www.siemens.com/plm

26374-Y1 12/14 C