

Document management in complex technical structures

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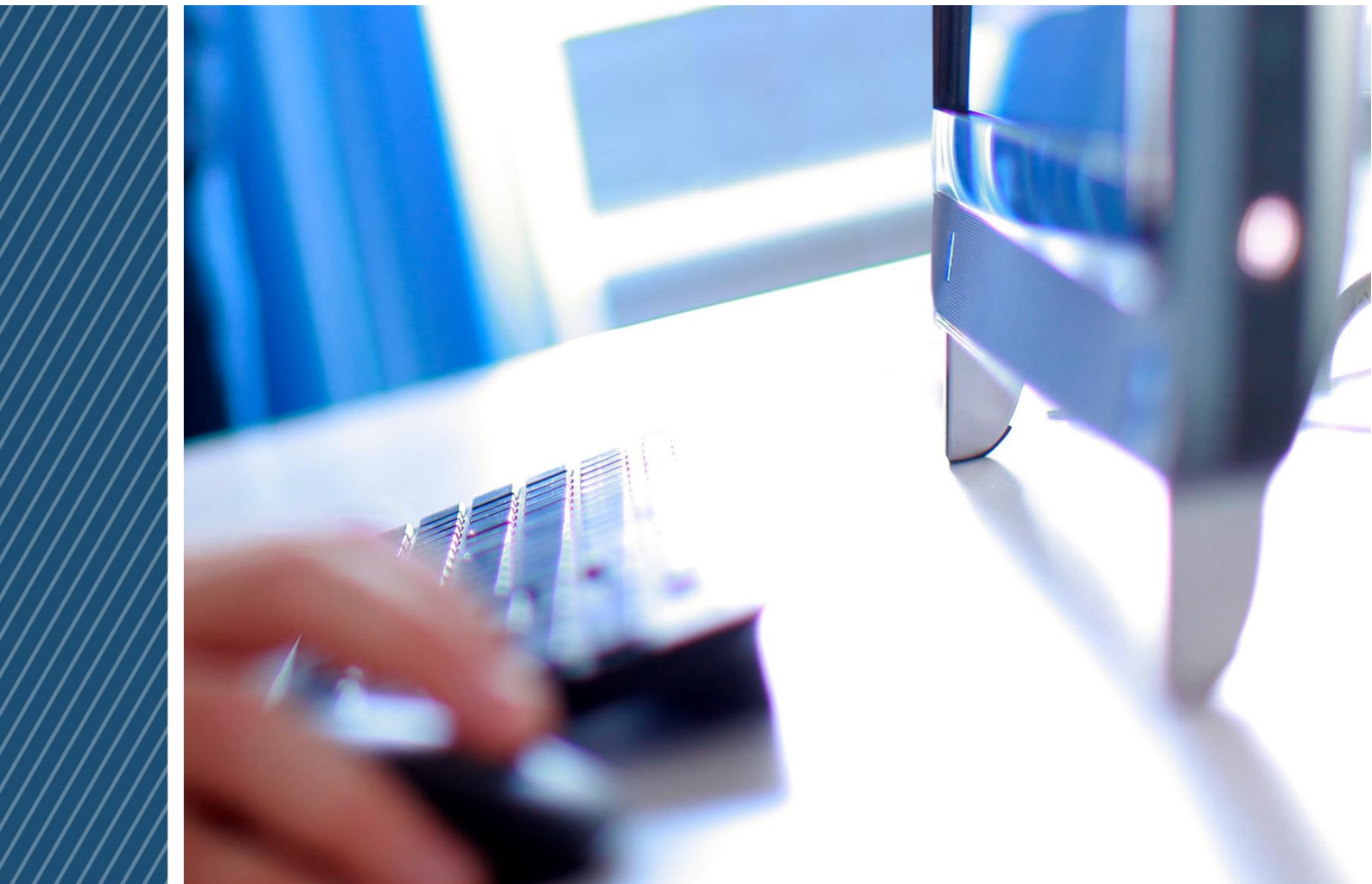


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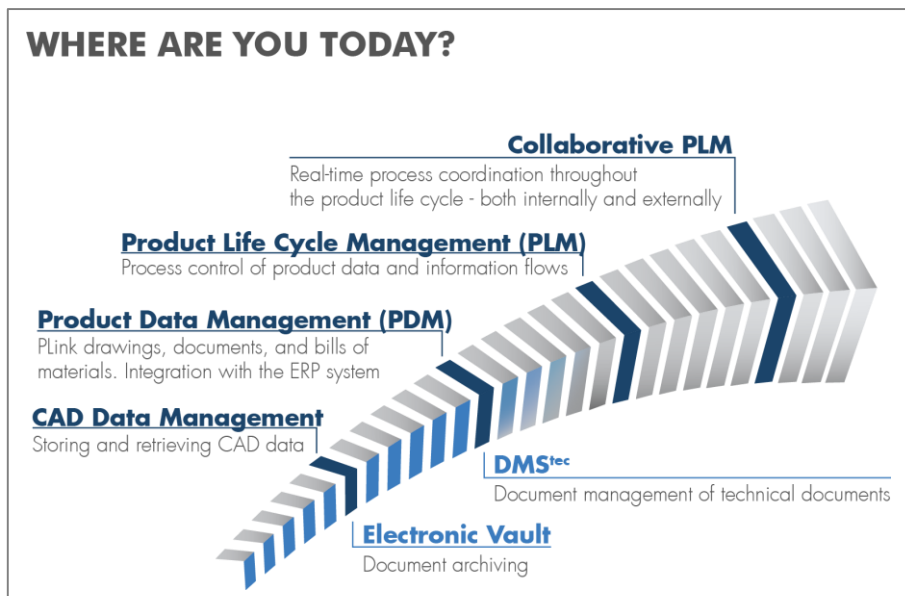
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Introduction

The highly complex environments found in mechanical and plant engineering firms, chemical companies, or the energy sector regularly push conventional document management systems to their limits. The fact that they need their storage to be carefully structured and their processes and project management to be supported accordingly results in demanding document management requirements. The term "DMS^{tec}" is often used to categorize this DMS discipline; some vendors focus on special offers in this particular field. Knowing this, companies with these specific requirements should differentiate between DMS vendors and carefully examine the capabilities of their DMS systems, as PDM and DMS provide the foundation for developing a process strategy for your product lifecycle management (PLM).



Challenges for technical companies

Today, technical products need to be developed against ever tighter deadlines. In many cases, this results in development, production and sales departments working on the same product, without basing their efforts on the same data and documents.

More than ever before, collaboration needs to cross department lines and this can only be achieved by having everyone work with the same data and documents. So why is not yet a reality for many companies? After all, different solutions for data and document storage in technical environments have been around for a long time: CAD/CAE and PDM systems for product development, ERP/SCM suites for manufacturing and logistics processes, CRM solutions to connect with customers, and document management systems (DMS) for document control purposes.

But today, the documents that are created within a company's core applications are still being managed separately: PDM systems for anything CAD-related, DMS for ERP, SCM and SRM documents. This makes it very difficult to work with consistent product-relevant data and documents across department lines. It would make much more sense to set up a common product data backbone that brings together the different documents involved. Ordinary document management systems, however, lack the functionality to match the level

of complexity found in mechanical and plant engineering firms, chemical companies, the energy sector or other technically demanding industries. Many PDM systems, on the other hand, lack DMS functionality.

Companies may tackle the issue in different departments and either from a DMS or a PDM perspective, but in the end, technically advanced companies with complex products need a unified product data backbone that covers both DMS and PDM on a common data platform.

PRO.FILE, PROCAD's PDM and DMS^{tec} system, fully meets the demands of such a product data backbone and provides the perfect way for companies to get started with DMS^{tec} and expand to PDM and PLM or the other way around: They can structure their product information to correspond to their product's structure and implement proper document controls in a way that reflects a company's typical processes.

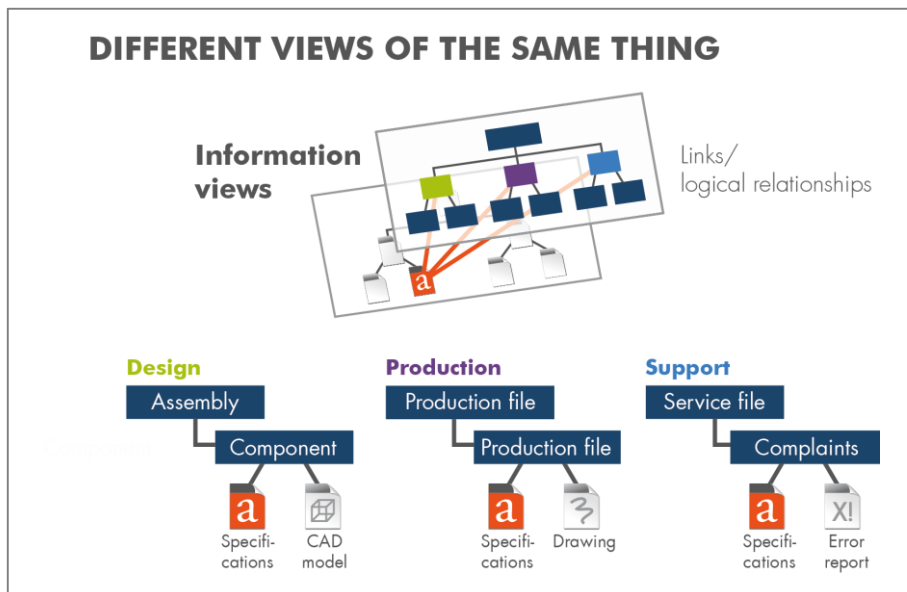
The suffix makes all the difference: from DMS to DMS^{tec}

DMS as a data tank that allows users to instantly retrieve any document simply by entering one or two keywords using a Google search feature? What is being touted as the latest and greatest in minimalism is not enough for complex technical product environments. It is simply not possible to map the structure of projects, products, and plants and the corresponding document controls using keyword indexing and search terms. Documents stored in DMS systems and portal solutions like SharePoint lack context with the product data and the product lifecycle processes.

A part's structural information is traditionally created by a company's development team and then used by its production and sales departments. CAD, PDM, ERP and CRM systems, however, are seldom run in consistently managed structures. Looking at the storage mechanisms of conventional file systems like Windows Explorer and the large amounts of unstructured data this produces, one thing quickly becomes apparent: They fail to provide the required level of control over versions, release mechanisms, and collaboration efforts.

Conventional folder structures are not all suited to provide a structured product data backbone. If, for example, an engine has been installed in five different locations throughout a plant, its specifications will be stored in five different locations within the folder structure. If changes are made, they will need to be synchronized across these five locations. And this does not even take into account the fact that the specifications provided by the development, product and purchasing departments and the product descriptions of the sales teams are most likely stored in completely different folder structures or even systems, even though they are dealing with the same engine.

The storage and indexing features of conventional document management systems do allow companies to establish connections between documents by using the same keywords. It is, however, not possible to clearly establish their relationships based on a document's tag alone, as this can only be achieved based on a plant's structure, as it is not intrinsically tied to any document. Just as a patient file belongs to a particular patient, technical documents belong to the corresponding assembly of a plant or machine.



Documents are inserted into the machine's or plant's structure

That is why DMS^{tec} manages product structures, plants, or infrastructure objects in a way that is detached of the document itself. Structures can be determined by the technical characteristics of a plant or product or by their location and there can be multiple structures that are completely independent of one another. The structure itself is created through links and meta data/key characteristics. This means that the structures into which the individual documents are stored, or rather inserted, are used to map relationships. Links are used to control workflows based on these relationships and ensure that the same information is made available and editable from a single location only.

This marks a step away from file system-oriented folder structures and towards dynamic views over a common data backbone. Each document, along with certain information, is stored in a single location only and then incorporated into structures that reflect its logical relationships. A folder structure is established nonetheless to provide a dynamic view of all of this. So the document is not actually stored in a specific folder, the folder structure rather is just one way to view the document.

Design departments will want to create a different view over a part's drawings and CAD models than the production teams, which are usually more interested in assembly and production reports. The sales force on the other hand will want to look at supplier bids, complaints and such. And because every document is only stored once in a DMS^{tec} system, everyone will always access the latest version of the documents they need.

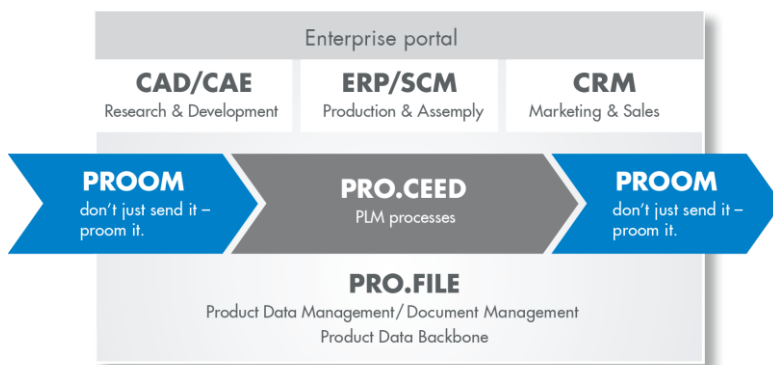
Bids, orders, and order confirmations, for example, often serve to determine the initial project structures within the ERP system. These refer to a (standard) plant and are then transferred to the DMS^{tec} or PDM structure in PRO.FILE where they create an empty file, thereby generating the machine/lifecycle file for the plant in question. It will be populated with data provided by the mechanical design (CAD models, drawings, engineering BOMs), electrical design (circuit diagram, BOMs, external data sheets), project planning (specifications, customer drawings, email correspondence, production data sheets), quality assurance (release reports) and service (service reports) teams.

Infrastructure companies such as the City Utilities of Dusseldorf, for example, have mapped entire power plants using key characteristics and meta data in PROCAD's DMS^{tec} system PRO.FILE. The underlying structure is established independently of any documents and provides the document control framework.

A unified product data backbone to base your document control on

Machine files built on a consistent product data backbone are perfect for exercising the type of document control that mechanical and plant engineering firms, chemical companies, or energy suppliers – really any company that regularly deals with complex technical structures – cannot do without. The more a company relies on structured document control/approval/maintenance processes, the more important structure management in DMS, that is DMS^{tec}, becomes.

Document control here means being able to control document changes and flows. The DIN 9001 standard defines it as the assignment of documents to tasks and responsibilities. This must be based on structures that exist independently of the document. Document control is the logical next step following the introduction of a product data backbone for DMS^{tec} and PDM. This is when the company evolves to the next level: product lifecycle management (PLM).



With PRO.CEED, PROCAD has developed the perfect toolset for document control and PLM. Its data exchange platform PROOM allows companies to integrate their PLM processes with their suppliers, partners, and customers using cloud-based services.

PRO.FILE serves as the product data backbone, delivering product data and document management capabilities and controlling the status of documents or parts; this then provides the basis for implementing product lifecycle processes with PRO.CEED. These in turn will produce task files such as "change process".

Why engineering companies need DMS^{tec}

Conventional document management systems are simply ineffective at mapping the complex structures exhibited in mechanical and plant engineering firms as well as infrastructure or chemical companies. DMS^{tec} describes a particular type of document management system that is capable of mapping these structures and can be used both as a PDM and DMS system. This lets companies establish a unified product data backbone, which in turn allows them to map their PLM processes. Any company with such complex requirements should be aware of these implications when introducing DMS or PDM systems, regardless of whether this introduction is driven by the development department, the IT department or any other business department. If they are not careful, this type of project will quickly result in a tangle of interfaces or end up as just another document and data storage location.

Structure and order are the key to speed and accuracy. Being able to deliberately and precisely control your data and documents ultimately hinges on the successful implementation of the right processes based on a system that meets your needs.

Your contact

Do you have questions or need more information?

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