

CAD-CAM REPORT

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EXPERT PARTNER FOR CAD/PDM MIGRATION



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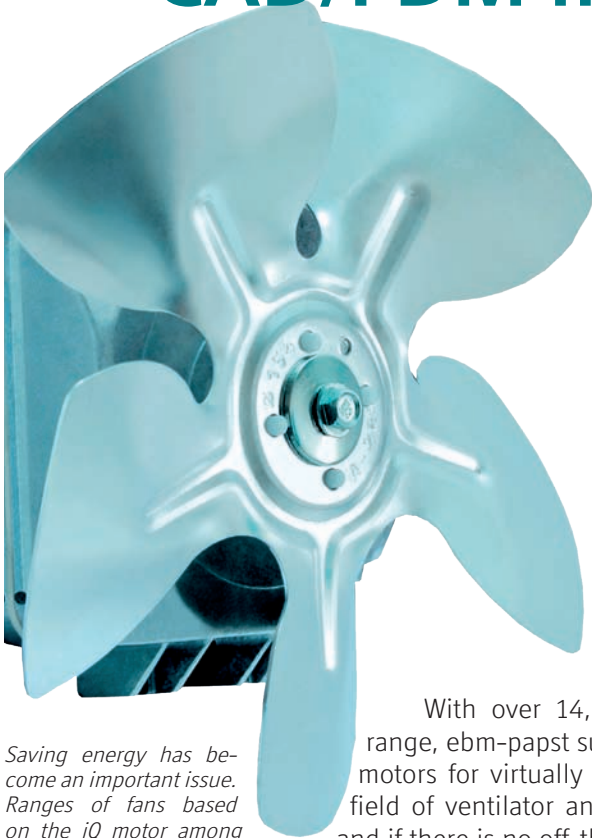


PROSTEP
integrate the future



(Pictures: ebm-papst)

Expert partner for CAD/PDM migration



Saving energy has become an important issue. Ranges of fans based on the iQ motor among others deliver high efficiency coupled with a long service life, which is a specific requirement of refrigeration systems.

With over 14,500 products in their range, ebm-papst supply suitable fans and motors for virtually any application in the field of ventilator and drive engineering – and if there is no off-the-shelf solution, more than 500 engineers at the company are there to develop custom solutions. And in today's world, suitable means, above all, energy-efficient. The company is the world's leading innovator in the field of EC drive technology, i.e. the development of brushless electric motors with integrated DC transformers that deliver greater efficiency and therefore use far less

There are many obstacles to be surmounted when switching to a new CAD/PDM system, not least of which is the migration of existing data. Utilizing the services of the software vendor is not the only option for migrating such data. The Landshut-based manufacturers of motors and fans ebm-papst imported their CAD and PDM data into the Windchill PDMLink system from PTC with the assistance of PROSTEP AG, which allowed them to complete this demanding migration project on time and below budget.

Michael Wendenburg, trade journalist, Seville

power than traditional AC motors. „Although they are extremely robust, AC motors actually act as an efficient form of heating,“ explains Alexander Bleiholder, Head of series support design in Landshut.

Alongside the headquarters in Mulfingen and St. Georgen in the Black Forest, Landshut is the third location the company has in Germany. In Landshut, ebm-papst develops fans and EC motors for gas central heating and white goods such as fan ovens, ice boxes, freezers and dishwashers. Until recently, the engineers used the direct modeling system Creo Elements/Direct (formerly CoCreate

Modeling) from PTC to design products and production equipment. At the end of 2009, they were faced with the choice of either updating their existing solution or replacing it with a parametric system. Bleiholder: „The parametric approach has the advantage that it is easier for us to standardize our product portfolio by reusing families of components and assemblies.“ The choice was between the Dassault software Catia, used by their colleagues in St. Georgen, and the PTC solution Pro/Engineer (now called Creo Elements/Pro), which is used in Mulfingen.

Following extensive benchmark testing, ebm-papst Landshut opted to switch to the PTC system. The availability of a powerful interface between the PDM system Windchill PDMLink and the ERP solution from SAP was also an important consideration. This interface allows the entire factory to access approved production documentation, and additional interfaces also enable the production facilities in Slovenia, the Czech Republic and China to access such documents.

Even ignoring the issue of compatibility, migrating the data was expected to be an expensive operation that would take a considerable amount of time. In particular, this was true for the conversion of the CAD data, which was partly due to different work practices in product development and the design of production equipment (in BMK), as Michael Fischer from the IT department explains. Whereas the product developers modeled their motors and fans as individual components and only defined the items in the assembly file, their colleagues in BMK saved the tools and production equipment as complete packages including all the item data and geometric data, which meant that the same components could be contained in several different packages. A further difficulty was that BMK still had a large number of live 2D drawings in MI format, and they wanted these to continue to be available in the new environment.

Two-pronged approach to migration

The complexity of the migration requirements not only escalated the costs, but also cast doubts on whether the software vendor alone would be able to handle the migration within the planned timeframe. ebm-papst Landshut therefore decided to adopt a two-pronged approach: The CoCreate specialists at PTC worked closely with the CAD administrator responsible for the old system to ex-



port the CAD and PDM data from the existing system environment and make it available in PTC's neutral format. Because of their experience with migration projects, conversion of the CAD data and importing this into the PDM system was entrusted to Darmstadt-based PROSTEP AG.

Earlier delays meant that the schedule for migrating the data was tight: ebm-papst wanted to complete the migration project, including re-training of the users, early in the summer. The reason for this urgency was that the heating engineering solutions business is very seasonal, so that the designers generally have a great deal to do in the second half of the year. This meant that PROSTEP had barely twelve weeks to set up the various conversion pipelines, convert and test the data and make it available in the new environment. In this context, „pipelines“, also known as „migration paths“, are the various ways via which the CAD and PDM data is extracted from a system environment and transferred to a new structure with new metadata. Different methods and process steps are required depending on the type of data (2D or 3D), the format, the lifecycle status (in progress, approved, etc.) or version. And, of course, time did not stand still in Landshut. A concluding project step was necessary to migrate data that had been changed or created in the interim. Head of

Energy efficiency is one of the core objectives of the globally active technology company ebm-papst. Three locations in Germany strive to achieve this objective: At the headquarters in Mulfingen, the team specializes in solutions for ventilation and air-conditioning technology in buildings; miniature drives and the familiar compact fans used to cool electronic equipment are developed along with custom solutions for the automotive industry in St. Georgen in the Black Forest, and EC motors for gas central heating and household equipment are produced in Landshut in Bavaria.

Design Bleiholder: „Everything ran according to schedule when we switched systems, and as far as costs were concerned, we even came in slightly under budget.“

Aside from the time pressure, perhaps the greatest challenge in this project lay in coordinating the partners and specifying what data was to be exported to what quality level, and how it was to be imported. „Everybody worked together excellently,“ said Günther Kahlert, Head of IT in Landshut. „We deliberated for a long time before we decided what we wanted to migrate, and then, with the assistance of PROSTEP, we optimized the necessary pipelines to deliver a good result at the end of the process.“

ebm-papst ultimately chose not to pursue their initial idea of migrating the CAD data one-to-one, instead taking the opportunity of cleaning up the existing data as part of the migration process to allow it to be reused as efficiently as possible in the new environment. The project team thus decided, for instance, that approved assemblies were not to be converted automatically, but should instead be set up from scratch in Creo Elements/Pro. Günther Kahlert explains the background: „In the old environment, the components were not positioned in the same way as in our new design methodology, so that it would have been necessary to adjust the assemblies anyway.“ And Michael Fischer adds that different versions of a single component that are actually no longer used were often incorporated in various assemblies, and these would have caused problems during the import process.

Over 121,000 documents had to be migrated

The joint project team invested a considerable amount of time in specifying the various migration paths in order to keep the error rate as low as possible. On the basis of the OpenPDM Migration Toolkit from PROSTEP, the team defined the individual steps involved in converting the CAD data, mapping the associated metadata in Windchill PDMLink and validating the results. Rules for handling errors were also defined. Thanks to this preparatory work, more than 99% of the data was incorporated into the new environment without error. More than 12,000 product models and almost 2000 packages from the production equipment design department had to be converted and imported into the PDM system. To do this, the experts from Darmstadt used their own conversion service OpenDESC.com,



The NRG 77 gas blower increases thermal efficiency in the field of heating engineering.

which has been offering CAD services to large corporations and medium-sized suppliers in various sectors for over 15 years. Furthermore, more than 106,000 drawings in PDF/A or MI format were incorporated directly into Windchill PDMLink – a total of more than 121,000 documents with an overall data volume of 141 GB.

The quality of the data was verified with regular test runs and different scopes so that there were no unpleasant surprises when the new solution went live. A large proportion of the models (those with surfaces which had not been closed or edges that were not precisely aligned) were able to be repaired??? when the data was exported from the old system. If this was not possible, the users had to postprocess them the first time they were called in Creo Elements/Pro, which is a relatively simple operation. The error rate was somewhat higher with complex die-cast parts, and so frequently used housings were re-modeled in the parametric environment to allow them to subsequently be changed more rapidly.

Certain components were not exported at all. Rubber components, for instance, which still had to be modeled in a number of different variants in the old system in order to represent different installation scenarios, can now be represented in Creo Elements/Pro using flexible components. The old system is still active at a few workstations to allow the users to refer back to how the assembly was originally put together when creating new designs or modifying old ones. However, as Head of IT Kahlert stresses, it is the intention of IT to shut the system down in 12 months at the latest in order to avoid the need to main-



After successful migration of the CAD/PDM data, Head of IT Günther Kahlert can switch off the old application. This means that ebm-papst does not have to maintain two system environments and train users on both systems over an extended period.

tain two system environments over an extended period of time and to train users on both systems.

ebm-papst Landshut also adopted a pragmatic approach when it came to converting the 2D drawings. If they were old drawings of products that were only required for evidentiary purposes in the context of product liability, they were converted to PDF/A files and placed in the archive during the export process. There, they can still be found using the metadata in Windchill PDMLink. Large layout drawings from the production equipment design department, on the other hand, were transferred to the new environment in native Me10 or MI format, which allows users to access them with Windchill PDMLink and view them with the integrated viewer.

The 3D models from the production equipment design department were the most problematic during migration and resulted in the greatest postprocessing outlay. Michael Fischer recalls: „The integrity of some of the models was not 100%, even in the original system, because they comprised imported, third-party data, which meant that they were not able to be exported without difficulty.“ The users in BMK design not only a multitude of different types of machine tools, but also other production equipment such as robots, presses etc., which are generally sourced from external partners.

Unavoidable manual overhead to improve the data quality

Despite the fact that the conversion and import operations were automated, the product development staff also have additional work as a result of data migration, since they have to set up assemblies anew, enter the corresponding metadata in Windchill PDM-Link and then release the assemblies again. As a rule, they only do this as and when a particular assembly is required for a new customer order. However, with the assistance of external service providers, they have taken the precaution of already reconstructing those products which are subject to frequent changes. Alexander Bleiholder estimates that approximately ten percent of the assemblies are currently available in the new environment. „This additional overhead may appear to be tiresome, but ultimately ensures a far higher quality of data.“

Günther Kahlert stresses that „the objective of migrating the data was to provide the



Mission accomplished: Alexander Bleiholder, Head of series support design in Landshut (on the right) and Michael Fischer from IT, assisted by PROSTEP AG, converted more than 12,000 product models and almost 2000 packages from the production equipment design department and imported them into the PDM system – an impressive total of over 121,000 documents in all.

existing data in a new system environment while achieving the highest possible level of functionality in order to allow us to react to customer requirements more rapidly and to develop even more energy-efficient products.“ After all, it is not as though the requirements are becoming fewer. Customers are, for instance, asking for virtual models of the fans in order to be able to incorporate them in their products. Deriving simplified customer models such as these was an enormous job in the old system. Thanks to the automation options available in Creo Elements/Pro, this is now a matter of just a few minutes.

ebm-papst expects that switching to the new PTC solution will not only speed up the design work, but will also improve the homogeneity of the processes. The high-performance integration between PDM and ERP allows parts lists to now be extracted directly from Windchill PDMLink and provided in the SAP ERP environment together with 3D PDFs of the product models. This enables the staff in Purchasing, Preliminary Costing, Production Engineering and Service to better visualize the structure of the products. Seen like this, the outlay involved in switching systems ultimately benefits the entire company.

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