

Customer Success Story

U.S. Army CECOM

Army PDM Implementation Reduces Drawing Access Time by Eighty-five Percent

Each Engineer Saving an Average of Two Hours Per Day

The U.S. Army Communications-Electronics Command (CECOM) has reduced the time it takes to access drawings and other technical documents from 30 to 5 minutes by its legacy government-unique configuration management (CM) system, called TD/CMS(E) with CENTRA 2000 PDM system from Auto-trol Technology, Denver, Colorado. The original CM system didn't store drawings and documents, and it often did not match the data repository.

Implementation of a commercial PDM system made it possible for engineers to search key words, full text or metadata and obtain copies of all relevant drawings and documents in an average of only five minutes. Another advantage of the new approach is that any authorized user in the Army or supplier organizations can also access the data simply using a web browser. At a cost of less than \$700,000, including software and professional services, the implementation has a quick payback.

CECOM provides communications, command, control, computer, intelligence, electronic warfare and sensors products and services to America's soldiers. CECOM provides the architectural framework and systems engineering to ensure joint interoperability and horizontal technology integration across the battlespace. CECOM executes its mission throughout the lifecycle of warfighting systems and platforms through an integrated process of technology generation and application, acquisition excellence and logistics power projection.

Sustaining Communications

One of CECOM's major product areas is communications systems such as command and control equipment, telephones and hand-held radios. This includes providing spare parts, maintenance, training and documentation to users in the U.S. Army and to allied armed forces. In order to provide these services, it's essential that CECOM staff be able to quickly access drawings, specifications and other documentation relating to the communications equipment that they support. The importance of providing easy access to technical data has increased recently because of the fact that CECOM has restructured from a functional organization to product teams that have cradle to grave responsibility for their systems.

In the past, two primary systems were used to provide access to technical documentation. A relational database system called Technical Data/Configuration Management Systems (TD/CMS) with over 4 million records was used to track all available documentation on each product. Searching on a product produced a list of drawings and technical documents and the directory in which they were stored. The system had a relatively non-intuitive user interface that made it suitable for use only by dedicated users. A data repository was used to store raster images of the 1.4 million drawings required to describe the products supported by CECOM.

Data Access Was Time-consuming

One major problem with the old system was the amount of time required to access drawings and other documents. First, engineers went to the TD/CMS system and generated a list that might include dozens of drawings required to describe a particular product. Then, they had to download the files one by one from the data repository. Engineers then had to recreate the often complicated dependencies involved in the drawing files. This entire process took an

average of 30 minutes. Another problem was that with hundreds of drawings changing on an average day, it was very difficult to keep the database current. Engineers estimated that 40% of entries in TD/CMS did not reconcile with the data repository.

Several years ago, CECOM managers began investigating PDM systems in an effort to overcome these problems. After a literature search, they selected seven candidates for serious consideration. Based on the initial presentations, they narrowed their search to three companies that they felt provided all of the required capabilities. The next step was sending two members of the CECOM staff for training on each of these systems. CECOM management wanted a system that would be relatively easy to implement and use. They felt that having their people actually train in and operate the system would provide the acid test.

Software Selection

Once the users took their training and reported back to management, the decision was made to implement CENTRA 2000. The primary reason was that the people that CECOM sent for training, as well as the other members of the implementation team, were very impressed with the software's user interface. Basically, the user interface looks and feels much like the Microsoft Windows office productivity applications that they already use on a daily basis. Another factor in the decision was the working relationship that was established during the selection process between CECOM and Auto-trol staff members. The Auto-trol people gave CECOM a good feeling right from the very start that they would be flexible and meet the requirements of the application.

The amount of customization required to meet the Army's requirements was surprisingly small. The PDM system that was selected had nearly all of the required functionality right out of the box. Only very minor tailoring has been needed. None of this touches the core functionality of the product, so it will not need to be changed for future revisions of the product. CECOM managers had been warned that major PDM implementations like this often require as much as \$5 in professional services for each \$1 in software cost. But in this application, only about \$0.50 in services per dollar of software were required.

Data Conversion

The greatest challenge of the implementation process was converting the huge mass of existing data into the new system. This required a series of passes through the database. The first pass created objects, the second pass established relationships between the objects, the third pass filled in metadata fields with information such as the drawing number, author, etc., and the fourth pass organized the record for the proper product team. Auto-trol consultants developed the custom routines required to convert the data. Several iterations were required to fine-tune the routines until they were able to handle all of the existing data, consisting of more than **10,000,000 items**.

The new PDM system was installed on an Oracle database running on a Sun E4000 enterprise server with a 500 GB RAID array under the Solaris operating system. CECOM engineers have heavy clients that run under Windows on personal computers and provide access to the complete functionality of the program. Downstream users and vendors can access most features through a web browser. This thin client provides users with find, view, print, file check-in, file check-out and messaging capabilities. A key advantage of the thin client approach is that users require no installation and little if any training.

Time Savings

Engineers found that the time required to perform basic tasks was substantially reduced. An average of five times per day, engineers need to collect the drawings and documentation that define a particular product. Now, they can simply search for the product using any of a wide range of parameters, and all of the documentation that relates to the product appears on their screen for easy retrieval or browsing. The new PDM system vaults the CAD drawings, eliminating the need to collect those in a separate step. All of the interdrawing dependencies are maintained by the PDM system so the user doesn't have to deal with them. All in all, the process of collecting documentation can now be accomplished in only 5

minutes, saving an average of two hours per day per engineer.

The new PDM system also improves the quality of the documentation package. The database is now linked to the documents and the documents are vaulted so they can't be changed without updating the database. This makes it nearly impossible for an engineer to receive an outdated document in response to a query. Based on the ability of the new system to manage virtually any type of file, CECOM engineers now use it as a repository for engineering documents and data, maintenance manuals, training manuals and wide range of other information. These additional documents were scattered around many different locations in the past and were often difficult or impossible to find. The new system makes them available as part of the same query used to obtain product drawings.

The new PDM system is now up and running to CECOM's management's satisfaction. It is saving a large amount of engineering time while providing more complete and accurate product documentation. CECOM has been able to turn off the TD/CMS system, saving a considerable maintenance expense as well. The net result is that CECOM engineers are able to reduce time-to-field and provide improved field reliability and supportability while enhancing the new product-based organization structure. In the future, CECOM plans to save even more time by distributing technical manuals and downloading technical data packages to potential vendors over the web through the CENTRA 2000 PDM system.

For more information contact Auto-trol Technology Corporation, 12500 N. Washington Street, Denver, CO 80241-2400. Phone: 800-233-2882 Fax: 303-252-2249.

CENTRA 2000 is a registered trademark of Centra 2000, Inc., which is a wholly owned subsidiary of Auto-trol Technology Corporation. All other trademarks are the property of their respective owners.
