

*Simply better document management!*

## **Drawing Management – What You Need to Know**

Practical Program's Professional Services Group (PSG) has been involved in many engineering related document management projects in which the client wishes to improve the process of managing project related documents. This process may involve upgrading to an Engineering Document Management System (EDMS) or simply improving the current manual process. Engineering projects are often unique to other projects because of the complexity in managing engineering drawings. Most engineering projects have similar challenges which need to be addressed:

- 1) Gathering of initial data and information,
- 2) Managing the information throughout the project life cycle,
- 3) Distribution of information during and prior to completion of the project.

### **Gathering Project Information**

When it comes to managing project documents, most companies have a system for storing and retrieving information regardless if they are using software. The common method for organizing information absent the use of software is storing files in a directory and logging data into a database or spreadsheet.

If you are storing files in a directory without the use of software, then the naming nomenclature for these files must be perfect. If a file is misfiled and the name is incorrect, it may never be located again. To track the drawing, the electronic file is often represented by a row of data in a spreadsheet or database which may include the drawing number, project name, creation date, etc.

Companies that use a manual method of collecting this information will probably limit the types of documents to drawings and critical files only because of the monumental task of managing every related file. Those who are taking advantage of document management systems (DMS) can easily include other documentation such as emails, specifications, formulas, and more. If the necessity of managing project drawings is limited to internal efficiency and the number of simultaneous projects is limited, then manual management is usually adequate. Entities which are required to supply complete project documentation to external vendors or need to provide documentation for litigation will benefit exponentially from DMS software. Without it, gathering all project documentation would require workers to search multiple applications (Word, email, CAD, etc.) on multiple drives and result in many hours of labor to prepare the data for distribution.

Another major factor in the gathering of project information is whether you have control over the manner in which the data is delivered to your project managers. If all of your work is prepared internally, then you have complete control. Unfortunately, this is usually not the case. If you have data that is coming in from outside of your organization, can you influence the format that this data is presented in? You may get information delivered on a CD. You may receive data from email, FTP or a number of other delivery methods. The companies that receive data from multiple contractors via multiple methods have a big job in organizing this information into usable format.

Whether you use software or not, why not create a template for outsiders to submit information for your projects? A simple spreadsheet with 10-20 required data fields can reduce your work on the front end monumentally. If software is used, you may be able to import this information automatically and eliminate 90% of the work on the front-end.

### **Managing the Lifecycle**

The most complex part of managing project drawings and documents is in the lifecycle. During the lifecycle of project documents, they may undergo multiple changes, distribution, and collaboration between many parties. Companies who employ manual management of documents and drawings during the lifecycle must ensure adequate training and diligent execution of policies to ensure that mistakes are kept to a minimum. Again, this is realistic if the number of projects occurring is minimal. However, certain aspects of project management are impossible to achieve without software. These include, but are not limited to, unauthorized distribution and a full audit history.

Tasks which are included in the lifecycle process are editing documents, collaboration on those documents, and approval of the changes. The challenge of IT departments is controlling who has access to these files and what kind of access each user has. With manual management, IT departments set folder security for every folder in a project by adding a user to the security profile. If users float from project to project, then IT workers must constantly update the folder security. If a user does have access to a file, then when he/she needs to edit it, they can open it or copy it to their local. If the user opens the file from the server location, it will be locked for other users who try to open the file. If the user copies the file to their local drive, then the file on the server can be accessed by other users and work can eventually be overwritten. Companies can employ manual methods to prevent this problem from occurring. One method is to require the users to fill in a spreadsheet which notifies all other users that they currently have ownership of the document and no one else can edit it at this time. In this case, all users must check the spreadsheet to make sure a file is available.

DMS software will manage a user's security access and his project memberships. Profiles and users can be changed easily so if workers change from project to project, DMS software will allow non-IT personnel like a Project Manager to administer security efficiently. Software will also allow a user with the proper security to search for a file on metadata or content in the body of the document, and then check out that document. A big benefit to managing with software is that there are multiple levels of security at this point. What if the user is allowed to see or print the file but not edit it? In this case, he/she may view or print the file but they cannot have access to the native file for editing. Many engineering clients restrict the engineers from accessing the actual file, but the engineer can however click a button which will convert the file to a PDF and allow her/him to save the un-editable version to the local hard drive.

During this stage of the lifecycle, the drawings may be marked up by paper and pen and delivered to the designer by email or by physically delivering them. The collaboration of information leading to a final version may also include team members that are not residing at your physical location. In this case, some plans are delivered via UPS or FedEx. If software is used, members may download a PDF and markup in Adobe, or log into the DMS software and markup the drawing via a web browser. If a web browser is used, markups can be seen in a matter of seconds from anywhere in the world.

The next step in the lifecycle is to review the changes and approve or disapprove them. Once the designer has implemented all of the changes to the drawing or document, he will submit the document to the proper team members for approval. In some organizations, this may be a single person and the communication may be as simple as an email stating that the change is approved. If multiple members are involved in approving a document, then the process can be complex in managing comments from multiple members as well as making decisions about whose comments take precedence. Software may also be necessary in this case to reduce the margin of error in making decisions. Another factor to consider in the revision and approval process is the audit trail. When you need to find out why, when, and by whom a change was made; is that information available?

The last step in the lifecycle portion of management is the official revising of the document or drawing. In a manual process, the designer will copy the document, change the filename, and place the old copy in back-up location. DMS software will do basically the same thing automatically and prevents human error.

Organizations may spend weeks in conferences trying to iron out the perfect lifecycle management process with the perfect naming conventions and checks to ensure that this process is done perfectly. The release of the wrong drawing or drawing package can result in thousands to millions of lost revenue. When documents are submitted and distributed in a mixed array of methods, it can be very difficult to keep track of which is the latest version.

### **Distribution of Project Documents**

Lastly, the project documents usually have to be distributed in some manner to external recipients. Information may be distributed to a local archive, delivered to contractors and vendors, or to clients. The important considerations here are:

- 1) Do the distributed documents need be tracked for future reference?
- 2) Will the documents be distributed in the native format or in non-editable versions?
- 3) What method of distribution will be used?

Document transmittals often include a specific "tracking number" which can be used to follow a specific group of documents which are distributed to a specific recipient. It is important to be able to prove to the recipient which versions were distributed at a later date if asked. If the transmittal process is occurring manually, a worker will log each document's relevant data into a spreadsheet including at least the document name, revision, recipient, and date. Organizations that perform numerous transmittals almost have to use DMS or transmittal specific software.

Another very time consuming task of transmittals is the conversion of documents if this is required. Most organizations cringe at the thought of distributing native CAD drawings that may be edited by someone who is not authorized. These files are usually converted to PDF by a tool that will bind the reference files into the final conversion. A transmittal which includes hundreds of documents and drawings may require a full days worth of work if conversion is manual. DMS software will automatically convert the project files, create a cover sheet of included documents, and automatically record the transmittal history for future reference.

Once the transmittal is ready, organizations may transmit the actual drawings via email, FTP, or a web portal. If the size of the transmittal allows, email is the method of choice. Email is easy but it does not allow for tracking of activity or confirmation of receipt. FTP is a common method and organizations usually possess the internal expertise within their IT departments to manage this process without using expensive software. The most efficient way of communicating and tracking transmittals is via a web portal. The web portal can be posted via DMS software or SharePoint, or a combination of the two. Posting transmittals on a web portal can be most beneficial if feedback and collaboration are required and you want to assign a deadline. Recipients can even be assigned the ability to collaborate and post information to the project via the portal.

In the past, file sizes have often been a deterrent to the web method. Technology can aid this process via WAN accelerators (and other similar mechanisms) which will speed up the transfer of large files. WAN accelerators may also enhance the revising and markup process of the document lifecycle if your organization operates from multiple physical locations.

### **Summary**

All of the processes outlined can be managed effectively with or without software applications. Logically, the necessity for automation in any of these procedures outlined depends on the volume of processing taking place at each step. As organizations expand, they will inevitably begin using automation and it is critical to get the manual processes organized first. Automation may eliminate some of the manual steps, but you cannot effectively achieve automation unless you can outline your steps.

**Dv TDM** is a robust tool for managing technical documents and drawings. **Dv TDM** supports engineering and office documents including: AutoCAD, Microstation, Word, Excel, Outlook, PDF, email and many more. Manage and access technical project documents worldwide from a central repository through Internet Explorer.

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