Why Engineering Document Management is the Foundation of Manufacturing Success

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Manufacturing organizations face a critical choice: let engineering documentation chaos grow or take control of it.

Managing engineering documentation in a plant or facility environment that's constantly changing is a high stakes challenge. Maintenance and operations teams require fast access to accurate as-builts and equipment drawings, even as capital project and construction crews work on changes to the same facility.

Without a centralized platform for document access and control, there's no way to ensure continuity and streamline work processes. This leads to wasted time, version control mistakes, safety incidents, compliance issues, project delays, intellectual property at risk and a lack of traceability. The cost of inaction is clear: higher risk, lower efficiency and shrinking profits.

The solution to this common problem is an engineering document management (EDM) platform that connects teams and simplifies document access, control and collaboration. EDM enables organizations to drive best practices and standards, and it delivers the essential foundation needed for operational excellence and digital transformation.

Understanding the Value of an Engineering Document

Have you ever considered what your engineering documents are really worth to the organization?

These drawings, models and documents are a significant investment beyond the facility, equipment or product they represent. Each file requires hours of time and expertise to create, iterate, approve and maintain. If each document costs an average of $1,000, for example, and you have tens or hundreds of thousands of them, they represent a substantial asset to your company that's worth protecting. The company intellectual property contained within those documents further elevates their value.

Ask these questions when determining how to manage and protect your engineering documents:

- Are they centrally controlled and accessible?
- Are they traceable with an audit trail of who did what and when?
- Can your workforce easily find the latest version, with no duplicates to sort through?
- Can you collaborate easily with other departments, sites or contractors?
- Can they be routed through workflows automatically to ensure the correct path for document approval?

"The value is far larger than a set of drawings that describes a single $1 million asset. Every plant is a collection of many thousands of these documents," emphasizes Todd Cummings, vice president of research and development at Synergis Software, developer of the engineering document management system Adept. "These files aren't just a byproduct–they are a dynamic, living and breathing asset. They need to be treated as a critical investment."

There is value in understanding the relationships among documents that exist across manufacturing workflows, too, such as how drawings convey to work orders or specifications. For CAD users, it's invaluable to understand the parent-child relationships of AutoCAD XREFs, MicroStation reference files (XREFs) or SOLIDWORKS, or Autodesk Inventor parts, assemblies, drawings and configurations. A change to one part or drawing can impact many others, and it's critical to have visibility and control over that.

"The matrix of interrelationships of a facility asset and the documents that support it is more than the human mind can keep orderly, so a system is required to add clarity and provide control," adds Scott Lamond, vice president of marketing at Synergis.

The High Cost of Document Chaos

The scary truth for most organizations is that documents are all over the place. Duplicates are buried on individuals' hard drives and email inboxes, and there are paper copies on desks, in vehicles and out on the plant floor. On the network, they're buried in complex folder structures where each department or discipline has their own organizing principles. They know how to get to the information, but no one else does.

And for organizations that have grown by acquisition, it's likely there are exponentially more ways files are stored and managed. In most cases, there are no companywide standards for folder organization and management.

Study after study shows that knowledge workers spend 20-30% of their time searching for information. Yet even if they find the document they're looking for, there's no easy way to know if it's the latest revision.

Some organizations try to use general document or content management systems and are frustrated to find these don't meet the complex requirements of managing engineering information.

"When organizations don't have centralized access and control of their engineering documentation, they expose themselves to more than an efficiency issue," Lamond says. "Without an EDM system, they face immediate and serious problems that increase risk and diminish profitability."

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Scott Lamond
Vice President of Marketing
Synergis Software

Improving Plant and Facility Operations With EDM

EDM provides organizations with a system to optimize plant and facility operations while lowering the risk of issues that can have massive repercussions, like a safety incident, compliance fine or a lawsuit that jeopardizes the brand.

Here are six ways organizing engineering documents in an EDM system can reduce risk, rework and other costs.

Avoid safety incidents: Proper document management is a life-critical standard in a manufacturing plant. EDM systems ensure essential documents can be sourced quickly, automate version control to enable a single source of truth, and align as-built documentation with ongoing projects to avoid costly mistakes. This means your team always has the right information in-hand.

"If someone follows an out-of-date procedure or works from an unapproved version, it could result in people being harmed or killed," says Randy Nettles, former Document Management System Architect at Dow Chemical and Platform Product Owner for Synergis Software.

Respond quickly to emergent situations: In the event of a critical malfunction or outage, manufacturing teams need fast access to accurate information. Successfully assessing the situation and finding a resolution both hinge on the ability to reference accurate versions of documents.

"This is also critical in the prevention aspect," Cummings adds. "Even regular maintenance and inspection relies on having confidence in document reliability. Proactive upkeep will then, in turn, minimize the risk of a shutdown or malfunction occurring in the first place."

Get ahead of project delays: Capital engineering projects consistently overrun on cost and schedule. When manufacturers utilize a centralized platform for collaboration and ensure the right people have access to the right information, projects run efficiently, and timelines are met or accelerated.

"Imagine a plant that generates a million dollars in gross margin per day. The ability to complete a renovation and get it live just one day faster will have a significant financial impact," Lamond states.

Reduce costly change orders and rework: A misalignment between owner/operator and external contractor teams typically result in costly change orders and scrap. These mishaps increase project budgets and extend timelines.

Simplify compliance: Regulatory requirements and industry standards across many industries require organizations to have their documents under control. They need to be able to validate document control, data integrity and traceability. An EDM system provides the control and automation to drive best practices and simplify compliance.

Protect intellectual property: Nearly half (45%) of U.S. companies have had intellectual property stolen–at a total cost of $250 billion annually. The intellectual property contained in your engineering documents is considered to be the "company jewels" that differentiate the organization and give it a competitive edge. With hundreds or thousands of users accessing files directly across a company network, it's essential to ensure document security, granular control over access rights and deep traceability.

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> Vice President of Marketing
> Synergis Software

10 Benefits You Can Expect From Adept EDM

1. **Centralized source of truth.** An EDM system provides centralized access and control of facility as-builts, equipment drawings, capital project documentation and product data. It aligns teams so everyone is on the same page, drives efficiencies and ensures document control best practices happen automatically.

2. **Built-in version control.** Easy access to the latest document version reduces safety and reliability concerns, change orders, compliance issues and wasted time.

3. **Workflow automation.** The organization functions better when documents flow through the correct processes automatically. Time-based alerts and notifications help to identify bottlenecks, so work is completed on time.

4. **Seamless CAD integration.** Having EDM available right inside your CAD application enhances design workflow while maintaining file relationships. Adept is tightly integrated with AutoCAD, MicroStation, Autodesk Inventor and SOLIDWORKS.

5. **Visualization and markup for non-CAD users.** EDM makes it easy for those on the plant floor or in the field to find, view and markup virtually any document including drawings, models, office documents and graphics files. They can communicate feedback, changes and ideas from a computer or mobile device, whether on or offline, day or night.

6. **Enhanced security and traceability.** Enjoy greater confidence in the availability, integrity and confidentiality of your data–while meeting compliance requirements.

7. **Lower costs.** EDM lowers your operating costs by delivering a more efficient, connected organization and eliminating mistakes that result in expensive change orders and scrap, compliance fines and emergency repairs.

8. **Increased safety and reliability.** 24/7 access to accurate documents and drawings streamlines routine or emergency operations while reducing accidents, outages and liability.

9. **Better ROI on capital projects.** EDM can enhance project planning, budgeting and outcomes to satisfy expectations from regulators, shareholders and other stakeholders.

10. **Simplified compliance.** Automating and streamlining processes for regulatory compliance helps utilities meet deadlines, avoid fines and reduce administrative overhead.

Beyond the Basics: Lessons from Buzzi Unicem USA

When Bill Kovacs started at Buzzi Unicem in 2005, the simple act of locating a document was "like trying to find a needle in a haystack." The USA manufacturer of bulk cement had no formal system for document management, with open files stored primarily in Windows folders and on network drives.

"We would end up having to call USA colleagues to learn about where a file was or if it was even updated. It was extremely inefficient," said Kovacs, the company's past engineering and project management director.

Also missing was version control or version-based histories, as well as permission-based control over the actions a user could take on a document. Anyone could access and change a file at will. As a result, there were several instances where files could be accidentally deleted and couldn't be restored.

Without a record of changes, there wasn't visibility into what modifications had been made, by whom or when–meaning there was no guarantee a document reflected the latest version. In addition, the absence of an audit trail was a concerning risk, especially in the event of litigation.

"Our department manages large capital investments, not small retrofits. In any typical year, we may collectively be responsible for handling upwards of $200 million in capital expansion projects–that translates to thousands of engineering documents," explains Kovacs. "Given that in the early 2000s–even going back to the 1900s–many US cement company expansion projects were going into

litigation, we felt it important to employ a document management system that would allow us to organize and have audit trails for our organization in case a situation would ever occur in our project(s)."

"To best employ a document management system, we first needed to establish a repository for drawings, and second we needed to standardize the way our documentation was organized for database storage use."

"We, therefore, had to create a system that allowed us to best organize and integrate our information and data into database fields that captured the nomenclature and data most important in our day-to-day jobs," Kovacs said. "The goal was to have a system that would protect our documents so that no one could erase them, lose them or misapply them, while also being able to effectively search for what was needed."

Upon implementation, one challenge to overcome was converting people to a database-driven document management system. Employees were already familiar with storing information in file folders or even spreadsheets, so it would require change to have them embrace a dedicated EDM solution.

"We wanted to ensure that the system was easy to use, so we were strategic about developing the database structure," Kovacs stressed. "Because the capabilities of Adept allow other departments outside of our group to leverage the tool, we had to find out what data fields were important to all divisions and departments of the company. For example, for the same document, engineers would search based upon field criteria that may have been different than that used by a salesperson or maintenance technician."

"Once we understood what was important to these different groups, we were able to configure and set up Adept in a way that seemed to best work for everyone," Kovacs said. "In our case, documents were organized and easily located by plant, equipment type, asset number, year added or even vendor name for flexible searchability. For some groups, like technical services, environmental and legal, we set up specific ways for them to independently organize and access their information."

"Our system is configured so that every site can access files from every other plant," Kovacs adds. "If one plant is installing a new system of equipment, they can go to a sister plant that may have already used that same equipment type and pull down drawings to see what the hardware consists of or how that may work for or against them. Adept has empowered us to leverage data across the plants for great benefit, while giving us the controls we need in place to expand its use."

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>
> **Bill Kovacs**
> Director of Engineering
> and Project Management
> Buzzi Unicem

3 Steps to Optimize Plant Operations and Reduce Risk

Adept Engineering Document Management software gives you fast, centralized access to your most important drawings, documents and data in a secure, collaborative platform that saves time, reduces risk and lowers operating costs. It empowers you to drive best practices and provides the foundational platform needed to support your operational excellence and digital transformation initiatives.

Here's how to get started:

1. Schedule a personalized demo.
2. Learn the power of Engineering Document Management.
3. Watch your efficiency and bottom line skyrocket while you lower your risk.

SCHEDULE MY PERSONALIZED DEMO

Synergis Software

Synergis Software is the creator of Adept, the engineering document management platform that helps manufacturing companies transform operations and capital projects for increased efficiency and reduced risk. Adept delivers a centralized source of truth that connects teams and simplifies document access, control, and collaboration. With built-in view and markup tools that support hundreds of formats, along with seamless CAD and business system integrations, Adept redefines operational excellence and empowers growth.

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