

A low-angle photograph of a construction site. A large yellow tower crane is the central focus, extending from the bottom right towards the top left. The crane's lattice structure is clearly visible against a bright blue sky with light clouds. To the left, the skeletal concrete and steel framework of a multi-story building under construction is visible, showing various levels and structural elements.

Engineering Workflow and Document Management Systems for the AEC Industry

Architecture, Engineering, and Construction (AEC) companies require ongoing communications between project partners, as organized communication and active workflow management are vital to the success of the projects. AEC organizations typically deal with many third parties, including vendors and contractors, customers, and project owners, facilitating the requirement for efficient document distribution and communication. Companies can leverage an engineering document management system to ensure all contractual obligations with third parties are met by utilizing the systems communication tools (i.e., RFIs and Submittals) and the embedded audit trails for all document movements and project tasks accomplished by users.

Addressing Your Company's Needs

Document management systems are used in conjunction with other mission-critical systems (i.e., Asset Management, Maintenance Management, training management, etc.) to help organizations complete their objectives efficiently and in compliance with industry standards. Additionally, facilitating the secure distribution to third parties, such as vendors and contractors, is a key requirement to ensure the timeliness of document-centric communications.

Knowing exactly what your company needs is vital in determining which document management system best suits your business, and how workers will be interacting with the system. Document management systems also allow companies to manage document-centric workflows, versioning, document distribution, and redlining, providing clarity for project contributors and oversight for project managers.

Searching and Document Handling

As AEC companies kick off their digital transformation and reduce dependency on paper documents the need to organize files effectively comes to the forefront. The explosion of 2D and 3D CAD models has also contributed to the digital evolution, as managing these files becomes increasingly difficult as a company grows. Local systems (e.g., Windows File Manager) are no longer adequate for controlling the wealth of files used in engineering-based projects.

Document Management System vs. Local Devices

The use of PCs and laptops to execute and manage engineering workflows has become the norm for organizations. The majority of these workflows are document-centric (i.e., require or include documents that a key for decision-making, construction, or standard operating procedures). The digital files have been maintained and employed on user local machines for years, using decentralized software applications (e.g., Excel, Acrobat, and Windows File Manager). Centralized document management systems now provide a better way to maintain, distribute, and manage these files. The major differences are:

Document Management Systems:

- Automatic versioning of files based on preferred versioning schemes
- Full-text search and advanced search filters using conditional operators
- Automated document actions based on workflow configuration
- Secure communications with vendors and contractors
- Collaboration tools such as markups, (redlining), internal/external notifications, RFIs, and more.

Local Systems:

- Basic version control
- Organizations are subject to data loss by misplacing files or overwriting
- No automation
- Simplistic searching
- Little to no file sharing
- Unsecured communications via email
- No collaboration tools.

Document Management System Applications

Architecture and construction companies utilize engineering workflow and document management systems for a multitude of purposes, including:

- Project management
- Facilities and asset drawing management
- Project collaboration
- Workflow administration
- Document versioning
- In-field markup and photo attachments.

Project Management

Organizations can regain control over their engineering-based projects by using this type of system as a single source of truth across their organization. With a formal workflow and document management system, companies can access project files and review their status as well as view stored files across multiple locations and departments.

Project Collaboration and Workflow Administration

ImageSite and EngineBox, simplify project collaboration, as organizations can access and automate their key project workflows within the system. Users can automate document actions, such as moving, copying, archiving, publishing, and deleting, and can even launch transmittals automatically throughout a workflow. As a document is reviewed and approved, the system can automatically change a document's metadata to appropriately categorize the file (e.g., submitted, in-review, released, obsolete). Additionally, administrators can ensure the files are secure within the system, as the system changes a user's permissions as a document moves between workflow steps.

Workflow is easier to manage with automated notifications, overdue alerts, use of only the most current file versions, and redline and comment carryforward. Reports on workflow status can be viewed by all workflow participants (e.g., project managers, supervisors, technicians, document controllers, etc.) ensuring all project members know the project progress and if there are outstanding tasks to be performed. Automation of manual tasks, such as copying, emailing, and archiving gives project members more time to accomplish important tasks and ensures integrity in file management.

Document Versioning

ImageSite and EngineBox automatically update document versions as they are checked back into the system. Companies can base version numbers on their preferred versioning schemes, which can be numerical, alphabetical, or alphanumerical, and can even change between vendors and projects. This allows companies to use their traditional versioning schemes, making it easy to train new users, as engineers can use a familiar versioning scheme.

In-Field Markups and Photo Attachments

With ImageSite and EngineBox, workers can markup (redline) drawings from any location, making it easy to communicate changes upstream. Workers can indicate changes using images, text, audio, and even video, making it easy to communicate changes. Comments and Notes can be assigned with markups to show a string of changes and requirements. Additionally, markups allow organizations to create their library of symbols with variable text for engineering stamps or seals for approval and more.

Benefits of EDMS Software for AEC Companies

Companies in the construction industry require a vast number of documents to manage their projects and assets. No matter the scale of the project, companies need a system to manage these documents, as they can quickly lose control over their version integrity and essential workflows. Fortunately, electronic document management systems ensure companies are managing their documents by document management standards (including NIST), and provide a slew of benefits for these organizations.

Some noteworthy benefits include:

- Data security
- Efficient storage and business continuity
- Faster project turnaround
- Transparency for vendors and contractors.

Data Security

AEC companies face the ongoing threat of intellectual property theft. A document management system can mitigate or eliminate this threat by providing users with multiple levels of authentication and authorization. Features such as multi-factor authentication (MFA), IP blocking, and whitelisting can be used to ensure that only properly authenticated users have access to the system and its files. Additionally, once a permitted user enters the system, they will only be granted access to information pertinent to their role. This principle is known as “least privilege”, which is outlined by The National Institute of Standards and Technology (NIST) in SP 800-171. Audit trails monitor and report on user usage to report on malicious activity or track down who and when errors were made.

Efficient Storage and Business Continuity

Companies can utilize this technology to preserve knowledge, as all system users are required to follow the same set of document management procedures. This ensures organizations don't lose files as workers move between companies or retire. This is a critical element of a document management system as companies with high turnover, or a large number of employees often face these issues.

Faster Project Turnaround

Workers spend a large portion of their time searching for and handling documents, creating inefficiencies in workflows that can lead to project delays. ImageSite and EngineBox provide sophisticated and quick search capabilities using both metadata attributes and full-text search indexing. The systems also provide internal and external notifications to ensure the timeliness of projects, and accuracy of information. Users can also automate document actions, eliminating the time needed for manual handling of documents. Project managers can review workflow audit trails and analytically identify bottlenecks, inefficiencies, unneeded tasks, and general workflow velocity.

Transparency for Vendors and Contractors

With ImageSite and EngineBox, companies can ensure their vendors have access to the files they need, when they need them, without granting them access to your network or unnecessary files. Additionally, the RFI/Submittal and Transmittal modules, ensure speedy communications between third parties, and complete control over project deadlines. It is the perfect solution, as it helps construction companies improve collaboration and increase the overall efficiency of their workflows.

eQuorum

eQuorum is an engineering document management software provider offering Cloud, on-premise, and hybrid solutions for companies with a large number of files, file types, or locations. Companies have been utilizing this software for more than 27 years, including some of the country's leading engineering, aerospace, energy, national defense, architecture, pharmaceuticals, and companies.

Learn more about our EDMS solutions.

equorum.com