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Reduce Engineering Project Complexity

Engineering Document Management Enables Secure Collaboration and Concurrent Design and Revision Control

In a recent industry survey conducted with PennEnergy, 68% of the respondents indicated their organization is either evaluating or implementing an Enterprise Content Management (ECM)-based solution to solve the challenges of managing information for engineering, capital projects and asset management. This whitepaper explores the unique and complex challenges of engineering document management, and demonstrates how an ECM-based Engineering Document Management solution can meet these requirements, while improving productivity, business insight and compliance across your organization.

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Engineers are known for their dependability, reliability, resourcefulness, problem-solving skills and ability to think laterally. Whether working on a specific system schema or building a massive, multi-phase infrastructure project, they rely on their ability to manipulate and leverage information in pursuit of the best design, the most efficient process or the most fit-to-purpose structure. However, while engineers and engineering firms typically make the most of the information at hand, managing, controlling, sharing and distributing that information in all the ways that projects, partners and regulators demand is another, still more complicated, matter.

Technical, document-based data and information is at the very heart of what engineers do. Yet much of that data is unstructured, existing in non-standard formats that are not easily collated, shared or integrated into traditional business applications and platforms. CAD drawings, for example, are often an aggregation of files and data pulled from different sources, which makes it very difficult to manage in digital form once it goes beyond the originating application.

As the amount of unstructured information engineers must deal with proliferates, putting leading-edge document management systems, applications and tools into place—and making them accessible to a variety of stakeholders—is increasingly critical to engineers' ability to work effectively. This paper takes a closer look at some of the major information management-related business and industry trends affecting engineering firms and their clients; challenges they face during project execution; the characteristics of an effective engineering document management solution; and the benefits an ECM-based document management solution can have for engineers, their partners and their regulatory posture.

Complex Projects Require the Right Information at Hand

The actual design and construction of industrial systems, buildings and other major infrastructural elements can involve architects, designers, engineers, contractors, suppliers and manufacturers. Adding to the overall complexity of projects, all the stakeholders require effective methods for working with materials that often consist of tens or hundreds of thousands of files, in different formats including: Microsoft® Office files; PDFs; CAD drawings; and image files. They need a simple way to manage the complex relationships between engineering data, engineering drawings and related documents within their existing business processes and to make the most current revision of those documents available whenever and wherever they are required. And, although the concept of Engineering Document Management speaks most directly to engineering requirements, the owner-operators employing engineers or partnering with Engineering, Procurement and Contracting (EPC) firms also have a vested interest in its benefits.

Indeed, effective Engineering Document Management does more than address simple, in-house document handling needs. The ability to leverage documents and information on an enterprise-wide and global scale is directly linked to a number of existing and emerging industry challenges:

“The international experience of oil and gas companies indicates that it is actually impossible to develop large production projects without an instrument for the efficient management of project design documentation.”

SERGEY KOTOV, HEAD OF IT & TELECOM OFFICE, LUKOIL OVERSEAS BALTIC LTD. (DUBAI BRANCH).

An increasing number of joint ventures add complexity and risk. A joint venture creates a new legal entity that must meet specific regulatory compliance requirements and manage its risks, controls and reporting effectively. Moreover, EPC companies now often share the risk and behave like joint venture partners in very large projects. Both situations complicate the sharing and accessibility of critical documents among multiple parties, and speak to the need for even greater diligence around transparency, compliance and regulatory interests.

Operating cost controls mandate more rational IT spending. Increased pressure to control operating costs is causing CIOs and IT managers to reduce the number of purpose-built systems in their organizations and migrate to an integrated core business platform. This will affect organizations relying on multiple systems to manage engineering documentation and engineering master data, or whose systems are limited to very specific functional and operational purposes.

Growth of unstructured documentation challenges organizations' ability to maintain a single point-of-truth. The ability to concurrently design and review large volumes of highly specialized and unstructured documentation (e.g., CAD drawings, specifications, inspection reports, maintenance schedules) is critical to the engineering process. Moreover, firms need intelligent ways to manage, organize and distribute this information throughout the project, ensuring that the most current version of the document is available at all times.

Security of specialized technical documentation and drawings is a growing concern. The strong security around intellectual property remains a distinct competitive advantage. Engineering requires the complex creation, editing and review of CAD drawings and other technical documentation. In turn, engineers want simple, secure tools for reviewing, revising and annotating them. Being able to watermark, copy-protect (including printing), and expire content is important when distributing content to external contractors and joint venture partners.

Handover of technical documentation needs to be efficient. Traditionally, handover of technical documentation requires an intensive effort. To identify correct versions of engineering drawings, specifications, certifications, inspection reports, etc.; package them; and transfer them to the owner-operator is a process that often delays commissioning of the facility and adds costs in lost production. Energy companies, for example, are always looking for ways to better manage the handover of technical documentation and specifications between EPC contractors, equipment suppliers and owner-operators.

Internal and external collaboration requires control. Collaboration with multiple parties, both internal and external to the organization, is a growing business imperative for complex, multi-phase, globally distributed projects. Organizations need an efficient way to connect various project work groups and track the flow of information between them. When these groups are spread across different global regions, a precise, transparent, auditable trail of document creation, receipt, revision and approval is absolutely necessary to both manage regulatory risk and ensure that accurate and current information continues to inform the project at hand.

Having the correct information when you need it, is key to making informed decisions, driving project delivery and mitigating risks. Having a complete, managed audit trail and document history is critical insurance should due diligence or negligence come into question during a claim or dispute. To effectively deal with this broad and pressing range of issues, engineering firms, their partners and sub-contractors need to address the document management challenge and implement solutions that serve their mutual interests.

A Broad-Based but Engineering-Focused Solution

A proper Engineering Document Management solution shouldn't be a generic application that you have to adapt at your end. It should be able to manage all the types of information you manage, from CAD drawings to email, and integrate them with the tools you use every day.

Specifically, an Engineering Document Management solution should:

- Manage and organize engineering documents through an authoritative repository
- Integrate with the end-user's native applications such as their productivity suite (Microsoft Office), email client (IBM® Notes® or Microsoft Outlook), and CAD applications (AutoDesk® AutoCAD or Bentley® MicroStation®), increasing user adoption and reducing burden of managing information effectively
- Enforce engineering master data and document naming conventions in accordance with industry or corporate standards
- Support concurrent document revision or review by multiple teams
- Manage document revision requests and multiple revisions through various stages, such as "issued for construction" and "as-built"
- Support document control processes to manage distribution of information, and maintain a full history of completed revisions to documents-of-record
- Provide secure, web-based visualization and annotation capabilities so engineering content is accessible outside engineering applications, and beyond the corporate firewall
- Inherently support information governance and management of change processes for regulatory compliance and eDiscovery
- Provide secure access and collaboration around engineering documents from anywhere in the world, at any time – even on mobile devices.

The goal is to build a secure, collaborative web-based environment for engineers and their supporting teams, where they can create, capture, review and manage work, both in-progress and in its completed state. Moreover, the solution should be able to effectively disseminate documentation throughout the organization for ongoing review and approval.

To capture the greatest value from their information (and investments), agile companies are seeking greater integration between their engineering document management solution and other core business processes and systems across their organization. By integrating Enterprise Asset Management, Material Management, Supply Chain Management, Project Management and Financial Controls processes you gain greater business insight, and increased performance in project execution and delivery – ensuring that information is available in the right context, across the total life of your asset or process.

Effective Engineering Document management requires an ECM-based approach. Working from a core ECM platform—one that fully integrates content and the core business processes in your enterprise —enables end-to-end management of structured and unstructured information, even beyond the capital project phase.

ROBERT GASCHO, INDUSTRY STRATEGIST
| ENERGY SECTOR, OPENTEXT

Engineering Document Management Delivers Practical Benefits

One of the major concerns engineers have in working with today's non-stop data flow is getting the right materials from the "drawing board" to the "as-built" state. Being able to incorporate a wide variety of technical documentation, specifications, drawings, images, notes and other resources into their designs is critical. This means having the ability to access both materials anywhere on your specific worksite or in geographically remote corners of your organization, and to collaborate with colleagues to determine needs and track changes.

With a proper ECM-based Engineering Document Management solution in place, design engineers and other stakeholders can leverage collaboration tools and application flexibility to work on-the-premises, in remote branch offices, in the cloud or from mobile devices. They can ensure that all design documentation is maintained in its latest version, automatically numbered, cross-referenced and stored in a single location, ready for access in later project phases and ultimately in the operator's Asset and Maintenance Management systems.

Organizations that adopt advanced Engineering Document Management see a variety of practical benefits, including:

- Smooth, efficient handover of all technical documentation, contracts, engineering submissions and scope changes from construction to operations
- Efficient management of the flow of documentation packages and transmittals between external contractors and vendors
- A simplified review process for all documents pertaining to specific assets due to the ability to cross-reference controlled records to assets or equipment tags
- Reductions in errors and time spent on data management as a result of integration, interoperability and direct data mapping with other platforms and applications
- The ability to cross-reference technical documentation and assets to a geographically or spatially referenced location
- Availability of accurate and current information to all stakeholders at all times
- Scalability to support engineering projects and facilities across the enterprise
- Higher efficiency through use of a single user interface
- Enhanced collaboration and coordination around new document introduction, Efficient document control processes to support document revisions and concurrent document editing

"The ability to immediately make enquiry package and addendum data available to our tenderers, as well as electronic exchange of technical and commercial documentation with vendors and contractors, has had a big impact on cost and time to administer enquiries."

FRANSIE BLOEM, ASSOCIATE, HATCH

Case Studies

Companies around the world are currently reaping the benefits of Engineering Document Management solutions.

HATCH

"The OpenText ECM solution supports the management of EPCM projects from project feasibility study through to development, facility engineering, construction, and operation. A single and secure system, iPas DM enables the control and management of critical deliverable and non-deliverable documentation between Hatch clients, vendors, contractors and joint-venture partners"

Fransie Bloem, Associate, Hatch

To fully utilize its capital knowledge and ensure competitive edge, Hatch decided to implement a global document management and control system that would enable the consolidation of 25 different document management, control, and archive systems in use in Hatch worldwide.

A solution was required that would ensure effective collaboration between offices worldwide and provide a global outreach to all offices, project teams, vendors, contractors, partners, and customers by leveraging intranet and extranet functionalities with attention to information security. More than nine vendors were assessed in detail over a four-month period. Content Server was selected as the basis for the new Global Document Management and Control System. Some driving factors behind the decision were the solution's cost-effectiveness, support for SAP® integration, provision of robust security for access control, and the ability to meet the majority of Hatch's key business requirements.

LUKOIL OVERSEAS

OpenText Content Server provides the opportunity of organizing structured storage and prompt approval of Project Design Documentation (PDD) received from various engineering contractors. The possibility of integration with SAP® ERP also guarantees the availability of PDD accumulated during the construction stage when managing operated facilities in SAP PM.

Sergey Kotov, Head of IT & Telecom Office, LUKOIL Overseas Baltic Ltd. (Dubai Branch)

With Engineering Document Management, Good Work Is Never Out Of Reach

Today's engineers, and the companies that work with them, need enterprise-class ECM solutions that support large volumes of information and multiple users working on globally distributed project teams. They require consistent control and a single point-of-truth for managing engineering documentation, drawings and processes, including native integration to the applications they use every day, such as AutoCAD, MS Outlook, MS Word, and many more.

Despite this, the critical enabling aspects of advanced document management are sometimes not sufficiently recognized or prioritized. The fact is, ECM-based Engineering Document Management provides the best approach to managing technical documentation across the enterprise and throughout the total lifecycle of an asset.

Engineering is just one function in the complex design, construction, operations and maintenance of infrastructure and assets. ECM provides a foundation for integrating the engineering information and function to the other processes and disciplines in your organization. This is where you will gain the greatest impact and benefits.

OpenText understands ECM-based Engineering Document Management because ECM is where we come from. Moreover, as digital information continues to proliferate, economic pressures grow, inflexible point solutions become costly, and low-cost, quick-to-deploy solutions reveal their integrative and productivity limitations, ECM is where enterprise performance and productivity are headed.

To learn more about how Engineering Document Management can help your organization simplify information management and improve productivity and performance, please contact:

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