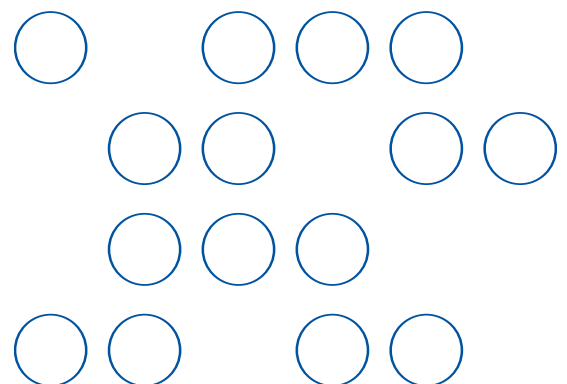




OpenEDMS®

From Unstructured to Structured: Transforming Documents into Knowledge





Challenges of Enterprise Document Management

Today, virtually all organizations, regardless of size, possess and manage a legacy of paper documents, accumulate a rapidly growing store of electronic documents, and anticipate a future that is mostly, but not entirely, electronic.

For many organizations, paper will continue to be important for as far ahead as they can see, even though they will rely increasingly on knowledge management technology. A study conducted by *The Delphi Group* in 1999 found that 90 percent of typical office tasks still revolve around paper gathering and distributing, and that while 15 percent of all paper handled is lost, 30 percent of our time is used trying to find these lost documents. Companies on average spend \$25,000 to fill a typical four-drawer file cabinet, \$2,000 to maintain it each year, and over its life, a single piece of paper costs an average of \$30.¹

The documents that organizations produce from spreadsheets, databases, and legacy systems contain structured information, much of which is numerical.

Converting unstructured documents to manageable information assets

However, organizations also produce a vast range of important documents – such as letters, reports, emails, marketing materials, studies, engineering drawings, handwritten consultation notes, and committee minutes – all of which contain unstructured information.

Structured and unstructured information comprise information

assets critically important to any organization. Unstructured information – and, therefore, the documents that contain it – constitutes an organization's memory of its processes and procedures, and its knowledgebase of its expertise, experience, and specializations.

Enterprise Document Management System – OpenEDMS

In 2002, in order to systematize its massive volume of property documents, yearbooks, and periodicals, the American arm of the ICFG approached Altimate Systems (now owned by Pitney Bowes Group 1 Software) to develop a secure, Internet-based document

management system. Altimate integrated its OpenEDMS document management system with ICFG's Internet portal system, Ezra. Since 2003 until today, ICFG has used OpenEDMS to manage millions of documents. With a central server farm located in California, this integrated system is now used daily by 3,000 ICFG employees across its United States offices to conveniently retrieve, review, and revise documents stored within its vast repository.

What's the major benefit of a document management system compared with a MS Windows or UNIX file server? A document management system differentiates itself from file server systems by adding the following functionalities:

- Version control function with library control provides document check-in/check-out and preserves all the versions and the history of version changes. It also enables users to compare version differences, revoke changes, and audit changes.
- Metadata provides business information to physical documents and folders. Metadata can classify information based on business logic and purpose, and can be used for fast information retrieval.
- Document workflow facilitates document submission, review, and approval processes.
- Record management provides retention policies, file plans allow the system administrator and management to automatically purge, backup, and archive system resources based on legal and company policies.
- Role-based access control for files and folders for business groups and users.
- Calibration tool of document management allows user to share information in real time by email notification, instant message, and dashboard.
- Automatic OCR process to convert image files into searchable PDF files and allow search engine to search for the content from pre-indexed files.
- Dynamic publishing provides dynamic real-time content to target locations, corporate web sites and Intranet portals.

High availability, accessibility, and replication are parameters that are orthogonal to all the above features. Web interfaces and Internet connectivity allow users to access the repository and use the system

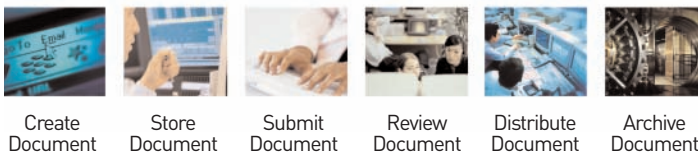
¹ *The Delphi Group, www.delphi.com.*



functions securely from anywhere and anytime with an Internet and/or Intranet connection. The web browser interface is a major differentiator that separates traditional client-server based systems from the Internet-based solutions.

Manage Document Lifecycle

The lifecycle of an electronic document is exactly the same as that of a hard-copy document: creation, submission, review, approval, distribution, retention, and archiving. The difference lies in the degree of automation and the speed of execution.



Document Creation

OpenEDMS provides authorized users with several methods of creating documents in the repository: batch file upload through FTP and LAN protocols, single file upload from the web browser interface, scanned image upload via OpenEDMS desktop, and drag and drop by WebDAV.

Creating documents in OpenEDMS means to import existing documents and folders into the EDMS central repository. By using a centralized document repository model, enterprises can easily manage and control the server environment for replication, security, retention, and define its access permissions.

Since the EDMS server resides in a secure network environment, it can be accessible either from the LAN, Intranet, or Internet. The central repository becomes a knowledge center for the enterprises for information sharing. One of the key features for a document management system is the metadata information for documents and folders. Compared with physical document types, such as PDF and MS Word, metadata is used by document management systems to give documents and folders business sense; document business classifications use metadata to encapsulate business related information.

Metadata not only provides the basis for a document index, but also serves as useful search criteria to greatly reduce the margin of unrelated search results.

The documents you create are not always static in nature; they can and do change over time to reflect changing business requirements. OpenEDMS version management allows you to control the various versions of a document and ensures that users have access to the most recent version. OpenEDMS retains all versions of a document within the repository. Version rollback allows you to retrieve an earlier version of a document in cases where a subsequent version is deemed no longer desirable.

Documents are created in a centralized document repository and logically stored in a flexible folder/subfolder hierarchy. All documents are stored in the OpenEDMS file server in their native format. Using the integrated viewer, users can view/annotate any digital document, regardless of whether or not they have the native application installed on their local machine. A corresponding index server provides links to all documents in the file server and accelerates document location and retrieval.

Document Review Process

Authorized document submitters, as defined on the workflow template, can submit documents for review directly from within the repository or, alternatively, from their local machine. Submitters can use a workflow template an infinite number of times; each instance of its use is considered and treated as a separate workflow process.

Authorized reviewers are notified by instant message or by email whenever they have workflow-related tasks to perform. When performing review/approval tasks, users can check in/check out documents, append explanatory comments, attach supporting documents, and digitally sign when they have completed a task.

Once you have approved documents for use throughout the organization, you can automatically distribute them to the people requiring the information, be it for knowledge management, purchasing management or operational management tasks. The OpenEDMS workflow designer allows you to define specific people to whom an approved document is distributed so that they may act upon the information immediately and to define specific storage folders for the approved documents.

Document Retention and Archiving

In the age of strict compliance regulations such as Sarbanes-Oxley, HIPAA, Basel II, and 21 CFR PART 11, secure document retention and archiving, including emails and associated attachments, is becoming increasingly more important. OpenEDMS



Document retention and archive management facilitage compliance reporting and disaster recovery procedures

user-definable document retention policies allow you to define, at the folder or document-class level, the length of time that documents are to be retained in the repository before they are archived, moved to another folder within the repository, or deleted.

Rather than delete repository resources that have ceased, for the current time, to serve an active purpose, you can consign selected resources to the system archives, where you can subsequently retrieve them, if needed. Archiving resources

enables you to remove outdated or inactive resources from the repository without the risk of irretrievably losing them. Archives can also be used as backups to your document repository, for purposes of disaster recovery. All archived resources can be exported and stored on portable media such as magnetic tape or DVD and stored off-site.

OpenEDMS supports full archive and disaster recovery restore procedures should you need to restore the contents of the repository.

What to Look for in an Enterprise Document Management Solution

The most effective enterprise document management systems have the following attributes:

Reside in a Centralized Repository

One of the benefits of an EDMS solution is the centralized document repository in which you can store all of your information assets. A centralized repository ensures that all users know where to find the information they require to perform their day-to-day tasks or to formulate corporate policies.

Provide Access Controls

A valid user ID and password are the first step in controlling access to the information contained in the repository. Once authorized users log in to the system, their ability to access documents and folders is controlled by an access control list.

Stringent, yet flexible, access control permissions, definable at the folder and file level, clearly delineate who has access to the documents contained in the repository and the type of access that they have. Users may be assigned, or denied, the following permissions: read, preview, download, create, delete, modify, print, or no access.

Use Metadata to Provide Structure

To streamline and stabilize massive volumes of unstructured content, OpenEDMS administrators can develop a number of customized document classes defined by an associated series of assigned metadata attributes.

A system-generated ID and a unique series of fully searchable, user-defined metadata attributes, which an administrator can create and save in the system, will identify each distinct document class. Metadata is an essential component of document management that can be used for business classification, fast information retrieval and retention management.

Metadata allows you to create a searchable index of all documents in the repository

Allow for Rapid Search and Retrieval

The ready availability of information is integral to virtually every stage of any business or decision-making process. The document search engine ensures that any information resource contained anywhere within the repository can be instantly retrieved for authorized users.

With a minimum of input, you can rapidly retrieve the information you need using any of a variety of flexible search parameters to pinpoint the precise location of specific files and folders.

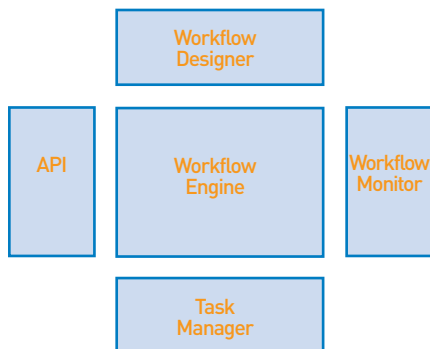
When conducting an advanced search, user-defined search filters containing any number or combination of search parameters, including document name, content, metadata, creation date, and author, can be created to reduce the margin of unrelated search results. Search filters can also be saved for subsequent reuse. When a search is conducted using a saved filter, the system instantly retrieves all of the documents that match the original parameters.



You can limit searches to specific folders and directories or extend them to encompass all repository content. All searches are confined to the active domain in which they are executed, however, and only those files and folders to which you have been granted at least read-level access permission will be displayed in the search results.

Workflow Management

A comprehensive document management system requires a workflow system to support the document submission, review, and approval process. Electronic document workflows allow organizations to replicate electronically established business logic for submitting, reviewing, approving, and distributing documents necessary to the formulation of corporate business tactics and to the execution of day-to-day business activities.



The OpenEDMS document workflow system is a subset implementation of the WFMC workflow model. It includes workflow designer, workflow manager, execution engine, and workflow monitor components.

The workflow designer allows authorized users to design workflow templates that exactly replicate existing review/approval processes. No longer do hard copy documents need to be passed from desk to desk, or department to department. The workflow engine routes documents electronically, which allows you to complete review/approval processes all the more quickly, immediately saving you time and effort.

A complete audit trail is maintained of all workflow-related tasks including timestamp, user ID, digital signature, and action performed.

Record Management

Record management provides functions to manage classified content by following specified regulations and business rules to manage critical business documents throughout their entire lifecycle from creation through final disposition.

Over the past year, we have witnessed numerous changes to the social-political landscape that have significantly impacted the ECM market. Events over the past several years such as the financial collapse of high-profile U.S. corporations, as well as ensuing changes to the regulatory environment such as Sarbanes-Oxley have placed a significant onus on the private and public sectors to adopt compliance-driven record management solutions.

The OpenEDMS Record Management Solution is an extension of the OpenEDMS document management system with features to support file plan, record creation, record classification and record retention. It is fully compliant system with DoD 5015.2 and other industry standards.

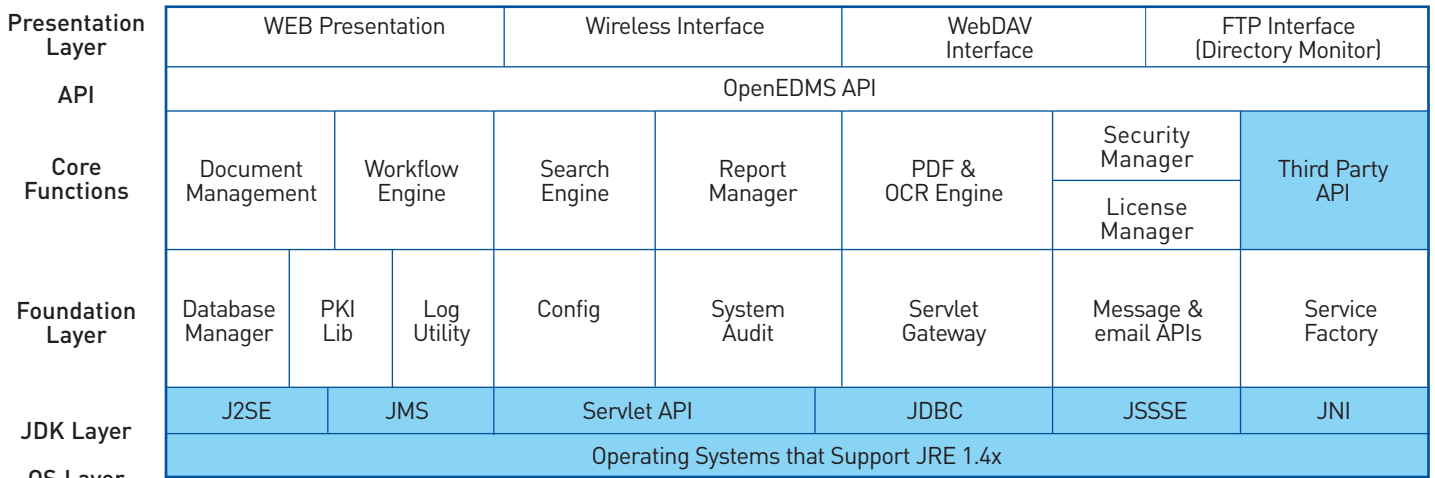
In OpenEDMS, a system resource such as a document, folder, workflow process, or email can be declared as record, which will follow record management rules guided with predefined file plans.

Technology Behind OpenEDMS

OpenEDMS provides all of the components needed to manage the lifecycle of enterprise documents. The OpenEDMS API layer provides the interface to legacy systems and third-party components. OpenEDMS API makes the core function components, including document management, workflow management, and report management accessible to external systems. The core of OpenEDMS is built with J2EE technologies and can be deployed on any platform that supports J2EE, such as Windows, UNIX, and Mainframe.

OpenEDMS supports standard enterprise database systems, such as Oracle and MS SQL server. IBM DB2 compatibility is planned for a future

Use case driven, architecture centric, iterative and incremental development process



Legend Internal Component External Component

release. In the middleware tier, the system runs on Apache Tomcat, BEA WebLogic (standalone and cluster), and IBM WebSphere. OpenEDMS supports database and middleware cluster implementations for load balancing and hot-swapping/fail-over.

The core of OpenEDMS is built with eFrame, which is the foundation layer that provides system horizontal functions required to build enterprise strength, secure, and manageable applications.

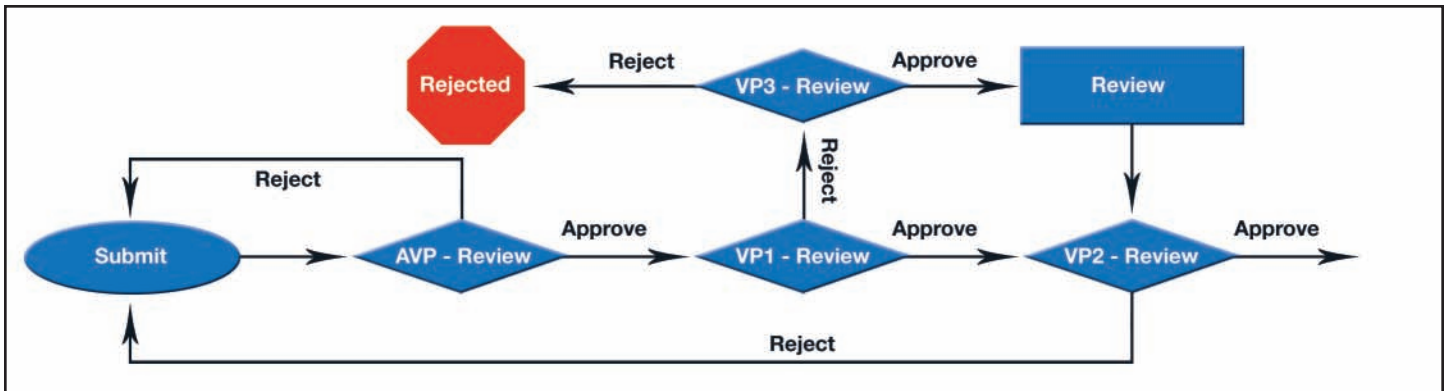
An OpenEDMS Case Study

Starting in 2006, the California Air Resources Board (CARB) implemented its engineering certification process system, Cert EDMS, with OpenEDMS. Cert EDMS manages CARB certification process and stores all conformity applications and associated documents in the OpenEDMS centralized repository. Manufacturers from around the world are now able to upload digital application documents directly to the agency's centralized repository, where they are automatically placed in designated submission folders. Flexible, yet stringent, folder and file access controls prevent manufacturers from viewing any material stored outside of their designated submission folders.

The exhaustive search capabilities of OpenEDMS make the location and retrieval of documents quick and effortless. Users can search the repository based on file name, file content, version number, creation date, keyword, status, and document class/metadata.

Replace Manual Retrieval with Advanced Search

To facilitate the location and retrieval of documents, CARB uses OpenEDMS document class and metadata management functions to classify conformity applications and associated documents. Documents related by class can be stored in a single folder or across multiple folders. Users can now search and quickly retrieve documents by the class to which they belong. Associating metadata elements with each document class allows CARB to further refine the storage and indexing of project documents, thereby making them even easier to locate and retrieve. Examples of document classes used by CARB include: Auxiliary Emission Control Devices, Emission Warranty Statement, EPA Certificate of Conformity, LDV Certification Application CBI – Common Section, PLT Report, and Internal Document.



For each document class, CARB has identified associated metadata elements that are to be defined whenever a document is stored in the repository. Examples include:

Document Class	Auxiliary Emission Control Devices	EPA Certificate of Conformity	LDV Certification Application CBI – Common Section
Metadata Elements	Manufacturer Model year Engine family name Approval number	Manufacturer Model year Certificate Engine family	Manufacturer Model year Application type Vehicle class
Document Class	Emission Warranty Statement	PLT Report	Internal Documents
Metadata Elements	Manufacturer Submit date Engine family name Category	Manufacturer Model year Engine family name Category Report type	Submit date Type Subject Category

When searching the repository, a user can enter a manufacturer name and retrieve all documents, e.g., emission control device documents and emission warranty statements, corresponding to that manufacturer.

To securely control information access, Cert EDMS partitioned into On Road, Off Road and Training domains. Folders, access control lists, metadata, workflow processes are created for each domain with users and groups that are limited to the specific domains.

Replace Paper, FedEx with Document Workflow Engine

When a manufacturer uploads a digital application to its designated submission folder, a document workflow review process is automatically triggered. The intuitive workflow design tool allows the CARB staff to develop stage-by-stage workflow templates that automate, streamline, and standardize the review and evaluation of incoming applications: all application documents submitted to a workflow for processing are automatically routed to the assigned knowledge workers, each of whom is promptly

notified whenever his/her input is required at any stage of the overall process.

In the event that any application requires revision or supplementary documentation, it is automatically directed back to the manufacturer who is immediately notified of the application’s status. The integrated mark-up utility enables staff to make electronic annotations directly on the surface of otherwise unmodified documents whenever necessary, while the accompanying redaction tool allows staff to digitally strike confidential content before documents are made available to the public.

The CARB no longer needs to cycle hard copy from desk to desk or department to department: conformity applications no longer accumulate unmanageably, as all documents are submitted, stored, and processed electronically. All documents submitted for review are automatically routed to the appropriate recipients to ensure optimal process efficiency.

Concluding Summary

Paper continues to play an important role in our business environment. With the increasing complexity of the global marketplace and stringent compliance laws, the need for an enterprise document management system has never been greater.

OpenEDMS is one of the systems in today’s Internet age to give enterprises and government agencies a tool to replace the paper-based way of managing documents. By working closely with industry sectors and government agencies, by applying the right technology and methods, OpenEDMS can provide a better environment to manage documents, so that you can do business more efficiently and securely.



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Our solutions consolidate, cleanse and enrich corporate information, locate data to specific geographies, and generate personalized business documents for customer care and efficient delivery, processing and archiving. Group 1 Software is part of Pitney Bowes, provider of the world's most comprehensive suite of Mailstream software, hardware, services and solutions to help companies manage their flow of mail, documents and packages to improve communication.

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