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**Notes and Observations on Global Electronic Document Management System (EDMS) deployment in Oil and Gas Exploration and Production (E&P) Companies**

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## 1. Introduction

This is a list of observations on general Global EDMS deployment in oil and gas companies. These are my own opinions based on what I have seen in numerous companies. I've put this together quite quickly as a bit of a brain dump, so apologise now for any grammatical errors!

It is critical to have clarity on the purpose and scope for a Global Electronic Document Management System (EDMS) technology rollout and the various roles it supports in the Information Management (IM) Lifecycle.

Philosophically, EDMS technology can be thought of as primarily supporting 2 basic parts of the IM Lifecycle

1. *Short-term* efficiency project/team sharing environment – information of temporary value - supporting workflow and other collaborative<sup>1</sup> approaches
2. *Long-term* information of value that needs to be retained. Supports *Compliance* for Group Records Management (GRM)

Furthermore, how information is internally organised within these 2 environments, has a critical influence on the quality of results produced by any search tools.

Historically, in many oil and gas companies, the role of the EDMS has not been crystal clear for end users, who end up using it simply like a global shared drive. Ultimately this leads to major problems with people finding definitive information of known quality.

The key is to introduce the EDMS with a framework of IM best practices and services to resolve existing IM frustrations and problems rather than exacerbate them by introducing yet another tool.

I've focused more on the IM and business challenges of a global EDMS deployment with examples from where most of my experience has been – Subsurface and Wells in EP. The challenges with agreeing project scope, project organisation and governance, budgets and business case in the current environment, internal cost models to make global EDMS adoption more likely, sustainability and IT network/latency issues are a given!

I've not covered the wider topic of Content Management Systems (CMS) including web authoring, for managing Intranets, Portals, Wiki's, Blogs or Discussion Forums. In all these cases, the principle should be that single copies of definitive documents are stored in the EDMS and linked and that some form of 'tagging' is required, to give the structure needed for effective search.

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<sup>1</sup> Including technologies such as Videocon, shared team calendars, task lists, messenger etc



## 2. Using an EDMS for information of temporary value

Some companies use one EDMS for project/team sharing and another for final definitive documentation that needs to be kept for the long term (what I term the 'digital library' concept or model). So some companies use Microsoft SharePoint for the working environment and Documentum or OpenText Livelink for the long term environment. Some companies use the same EDMS technology for both requirements (e.g. OpenText Livelink or Microsoft SharePoint). Microsoft SharePoint, particularly due to its close integration with the Microsoft Office environment, is being increasingly used for this project sharing collaborative environment. Whatever technology model is chosen, the 2 distinct roles remain.

### 2.1 Managing access control

After some basic training, certain users can setup 'projects' and add users to the project/team area. This differs from adding users to file-systems/shared drives, which typically is a request to an IT help desk in a large organisation. Through intuitive Graphical User Interfaces (GUI), users are empowered to manage their own access which can be faster and more effective. In practice for project/team sharing, any metadata about the document generally has *the same* access control/security as the document itself.

### 2.2 Folder structures and guidelines

Ad-hoc folder structures can be determined and controlled by the team members or coordinator, or they can 'copy' from some form of best practice folder templates. If you are not on the access control list, then you simply do not see that any of the documentation exists in these folders.

### 2.3 Attribution in the project/team environment

Teams may not choose to use any attribution in their project books (they commonly do not). Different companies have different views on whether to mandate minimum attributes in the project/team environment. Some companies do not want to create barriers for users taking up these new systems and feel they may be put off if they have to add attributes. Others see some as essential. Discussion below.

#### 2.3.1 Bibliographic (Title, Description, Author, Creation Date)

Its generally not mandated to add the free text attributes, title, author and date, even though this is often different to the automatically stored filename, creation date and person who adds the document into the EDMS.

#### 2.3.2 Control (Export Control, Disclosure, Security)

In some companies it is mandatory however, to select pick listed Export Control attribute for all documents added. Export control limits activities to certain countries, entities or individuals. For US Export Controls, General Embargoed Countries (GEC) is key and the export of controlled content outside the United States. It can also be mandatory to select a Disclosure in certain countries, including where there are information sharing sensitivities (e.g. Malaysia and Brunei). Many countries *do not* allow certain documents to be permanently stored outside their country.

#### 2.3.3 Information Security

The security classification of the document (*separate to the mechanics of access control*) is another attribute sometimes made mandatory. Where projects are deemed highly sensitive<sup>2</sup> a separate EDMS instance may be used. This has higher levels of security and encryption and is not normally accessible by contract staff or help desks. Executive Vice Presidents may use these secure systems to share their meeting minutes and secret projects (e.g. to acquire another company) may also be run in this environment.

It is possible, due to the nature of Export Control, Disclosure and Security to pre-attribute them through the project/team area if they are going to apply to large chunks of content. Then its painless for the user, as all the documents added will automatically inherit these attributes on addition to the appropriate EDMS areas.

This enables IT/IM groups to run smart reports on the EDMS and look for potential issues of non-compliance.

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<sup>2</sup> Sometimes called Most Confidential or Top Secret



#### **2.4 Version Control, Check-in and check-out**

Version control and audit trails in EDMS systems are fantastic. They allow far more effective management of interim versions than file-systems/shared drive. Check-in and check-out can avoid people working on the same document at the same time (when this is un-intentional).

#### **2.5 Global Sharing**

You can easily share documents with people from all over the world by using a shared project space or emailing them a link URL. This can be across company divisions (e.g. a project involving Gas&Power and Upstream). Extranet facilities also allow secure sharing with outside parties, such as suppliers, partners and governments. I have seen some great case studies of how an exploration team shared with its partner oil companies and Governments. Simple, but effective.

#### **2.6 Documents and Emails**

A 'record' is often not one document, but a collection of the actual document and the email that sent it. Or it may simply be the email. Many emails may be of temporary value, but some are of longer term value, especially where they document internal decisions or involve external correspondence. Some decisions, for example, are never formally documented, they are in fact emails. Quite often the assurance approval (with its caveats) of a subsurface model used on an oil and gas prospect is an email; enabling the team to proceed to the risk and volume review, for example.

#### **2.7 Audit Trail**

Tracking the list of people who have retrieved or modified a document is another feature of EDMS technology not possible on shared drive environment. Keeping this audit trail is a legal requirement for some companies, who must be able to show who has accessed records.

#### **2.8 Full Text Search in the project environment**

One of the key selling points should be offering full text search to end users. In many large organisations, due to performance, the full text indexing in Windows has been disabled, only allowing search on document titles. So the carrot offered to end users and teams, is by putting your documents into the EDMS environment, you can search for individual terms on PowerPoint slides, within Word documents etc. This should be a real efficiency saver, offering users something they did not have before.

#### **2.9 Ad-hoc application integration for project teams**

As the project areas and individual documents have a unique URL, it is easy to link documents to applications. A common example in the subsurface world is linking documents to Geographical Information Systems (GIS). Another example is showing project areas as 'web-parts' in Enterprise Information Portal (EIP) environments such as Microsoft SharePoint Portal Server and SAP, along with 'data'. In this environment, operational data can also be mixed with project documentation creating dashboards and domain portals. For example, having all the information at your fingertips when drilling a well, or monitoring a producing field.

The important thing to remember is at some point, snapshot pieces of information are created (needed) that have to be kept for the longer term. This information needs additional controls (see section 3). Any links to project environments will inevitable break longer term, but are useful in the short term.

#### **2.10 Speed of access - the Achilles heel of EDMS systems.**

The key issues with end users have historically been (and will remain) the fact the system is slower than file-systems due to the additional security layers & functionality. This is often the key complaint from end users. Where network bandwidth is poor, large files (>50Mb) can often time-out. Some improvements can be made using WAN Optimisation systems.



### 3. Using an EDMS for Records Management - knowledge sharing - information of long term value

As well as improving efficiency of project team sharing, the EDMS has a critical role to play in retaining and managing information for the longer term. This is where we move from just users performing activities on an EDMS, to include central and embedded Information Management staff performing a service.

#### **3.1 Publishing and Split in security of metadata and document content**

Perhaps one of the key differences between long term management with the project/team environment is differences in access control between document metadata and the actual document content<sup>3</sup>. Through the process of publishing<sup>4</sup>, the metadata about the document can often have a different access control/security than the actual document content. In other words, through searches, all staff<sup>5</sup> may see documents exist in this environment, but not always have default access to the document itself. It can be thought of as similar to the 'Library' model. Like any corporate 'library', there are items you find and click on and see immediately (often classed as 'open' or 'restricted to company staff'); there are others where, after finding the item, you have to request access ('confidential'). It could be that only people belonging to a certain legal entity are entitled to that information (e.g. Joint Venture).

What companies do want to see are records of both long term and temporary value in context to their project folder structures. So even if project teams publish content as they go along, they want to be able to see this information within their project environment. This is a requirement for any architecture deployed.

##### **3.1.1 Transfer of custodianship**

The process of publishing or record declaration effectively transfers the custodianship of the information from the project, team or discipline (business) to central IM professionals. Ownership is unaffected of course. This is a key concept.

#### **3.2 The 'Digital Library' Model**

End users can publish (often involving switching a flag on their documents in the project/team environment), or this can happen automatically if end users place documents in certain pre-attributed folder templates. It's the abstraction process.

Additionally, central or embedded document controllers help with this digital publishing process. Sometimes embedded data managers, technical assistants or the team leads themselves, take responsibility to publish as they go along. Experience has shown that best results are never achieved by trying to 'do it all at the end' when the project is finishing.

The 'Library'<sup>6</sup> model is important to E&P companies so all staff 'know what exists' even if they don't have default access to documents. The 'Library' in an E&P organisation is a huge knowledgebase or analogue store of techniques, experiences, results and lessons learned. It is impossible to predict who the exact audience or customers of your information will be in several years time, so the metadata must be open for people to search where possible, otherwise people will miss information when they search.

##### **3.2.1 Challenges with traditional library services**

Traditional libraries in oil and gas companies tend to use their own 'catalogues' (often different technology in different locations) with a historical basis on hardcopy, but increasingly moving into digital content. This content is often stored on web servers and file-systems. These central services need to embrace the EDMS technology and transfer their processes into this area where appropriate, when dealing with digital content.

<sup>3</sup> Of interest is also how access control in the working environment (perhaps held in SharePoint) can be automatically inherited (if appropriate) in the long term environment (Documentum or Livelink or FileNet)

<sup>4</sup> Record declaration is another term used

<sup>5</sup> Large user groups can be created (e.g. all E&P users or all Exploration users). Central IM groups associated with the EDMS can maintain these access groups.

<sup>6</sup> Sometimes digital libraries called e-vaults



Library services in the industry have done a good job at protecting the company's information for the long term, in what is not been classed by many, as a 'sexy' area of the business. It is mundane house-keeping. But then that is what long term information management<sup>7</sup> is. The issue is that these central services can only manage what they are given. They are in effect facilities there to be used. Generalising, libraries will not complain if you provide them 5 reports out of 10 they should have. They do not know what they should have and do not track information.

Some libraries have also shunned content that is not formal in nature. It is not uncommon for libraries to 'reject' a PowerPoint documenting the outcome of an Opportunity Framing Session – because it is not a formal report. This has led to significant information not being registered in libraries or managed properly.

Some companies have 'merged' hardcopy indexes with electronic ones in their business and search systems<sup>8</sup>. This enables people to find information in an area, project or on a topic, regardless of whether it is electronic or hardcopy form. Taking this a step further, \$Million scanning projects are taking prioritised hardcopy documents, converting them to digital files, to be stored in the EDMS. The focus is making content more accessible.

### **3.3 Exceptions to the Library Model**

Some Functions and departments will use the EDMS to keep their information for the long term (so they may publish or declare records) but are 'exempt' from the Library Model. In other words, their information is of no value to people outside that function or department or the document metadata itself is sensitive in nature.

#### **3.3.1 Functional information**

Examples would include Human Resources, who may store material in an EDMS on people according to strict Data Privacy Standards. This information is never likely to appear in a global 'library', even the metadata showing it exists. Another example is contracts and procurement. In these cases, both the metadata and document content will often retain the same access control as that used in the team/department site or project.

#### **3.3.2 Coded and most confidential projects**

Documents from new business projects involving acquisitions or deals may need to be kept for the long term. However, the document metadata may be sensitive, where even the coded project name may need to be kept secret. In this situation, publishing can occur, but the document metadata and content is kept confidential, so the average end user making searches will not find this information, even though it is published. Information Management professionals acting as custodians can make searches of this content and provide a link between the 'owner' and possible declassification of material in the future. For example, as soon as a coded project is declassified, the metadata can be made available to other staff. Access control therefore may remain the same as in the project environment. There are risks where the project team is small, that this information may be forgotten about, so having review dates for the security classification is prudent.

### **3.4 Group Records Management (GRM) – The file-plan**

For companies that have undergone Group Records Management (GRM) initiatives, there will be sets of file-plans and retention schedules across the business that have the list of records<sup>9</sup> that need to be kept for the long term. These GRM initiatives are often sponsored by the General Counsel (Legal). Challenges exist taking the principles from the Business Administration world into technical domains. The key elements are ensuring all documents on business file-plans have pick-listed attributes that determine:

- Legal Entity Owner
- Country of Jurisdiction

<sup>7</sup> Or Explicit Knowledge Management

<sup>8</sup> Some companies have gone further to catalogue views of 'data' and application archives and integrated with traditional 'documents so they can all be searched through single searches

<sup>9</sup> A record could be a document or 'data' stored in a database (e.g. reservoir model)



- Workgroup
- Record Type (tied to Retention)

Depending on the situation, these attributes can either be:

- Applied manually (added) on publishing from the project areas (or added to documents that may come from outside a project) to final destinations in the same EDMS technology (or another one).
- Or pre-attributed on folder templates within the project areas, making publishing easier as documents added to these areas will *inherit* these attributes. End users will not enough notice.

Legal entity owner is a vital attribute. Recently one oil company that was acting as operator for the government in a country, was required to produce all the government owned documentation (where they were acting as the custodian) related to those assets. Unfortunately over several years, they had added over 1Million documents into their EDMS with no way to differentiate this material from their own. It has been a costly mistake.

### **3.5 Unique Document Number**

Documents that are published can be automatically assigned a unique document number via the publishing process. This can happen in an automated way or manually<sup>10</sup>. Having a unique document number is critical. Some companies who are changing their EDMS technology are already finding that URL's to documents added in Report Appendices are unlikely to work in 5 years time. The Unique Document Number should be independent of the technology.

### **3.6 Changing access control and abstraction process**

Either way, a change in access control is often likely to occur from the project/team environment to the long term 'digital library'. Where this occurs between different EDMS systems, access control inheritance and integrity are crucial. An abstraction process is also required, as declassifying hundreds or thousands of documents of temporary value in a project/team environment will clog up the search systems. People need confidence that they have found definitive, final information. Sometimes at close-out or hand-over, a 'folder' or 'compound document' is published (e.g. a bunch of weekly reports sent during the lifetime of the project). Its important publishing is not too granular, 1 record does not necessarily equal 1 document.

### **3.7 GRM Reporting**

Reports per Workgroup and Legal Entity can be sent to the appropriate Focal Points and Vice Presidents in order for them to sign the annual business assurance letters. i.e. including compliance with Group Records Management.

In various business areas, for various reasons, they may use different applications to get their documents into the EDMS; however, the common denominator is all documents have RM attributes and reside within the EDMS.

Its broad strokes reporting, as the reports are purely volume based (e.g. x records published over past 3months for this workgroup). The issue with volume based reporting, is if a report indicates 200 records have been published for a workgroup in the last quarter, whilst showing that information is in fact being published (good) and generating a trend compared to the last quarter, it gives no absolute indication as to the 'completeness'. If in theory, the activities performed in that workgroup during that quarter meant 1,000 records should have been published, then 80% of the records have not been published. Based on historical business activity, some ball park expectations can be put in place of course, so people can make informed decisions on whether *interventions* are required.

To really ensure the business is capturing all the relevant information it needs, and ensuring it can retrieve it, more detailed reporting is needed. Reports based on file-plans, retention and legal entity will not tell you how complete you are in storing the specific products from your work processes. For example, you only know if you

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<sup>10</sup> Engineering projects in particular tend to follow naming conventions/tag numbers in addition to any auto-generated number. External documents from suppliers, partners, and governments will also have their own unique numbers. SAP Financials may also generate their own unique numbers.



have stored all the Well Programmes from drilled wells if you know *how many wells* you have drilled in each location.

### **3.8 Document Storage**

To cope with the volumes, some companies are likely to use automated rule based archiving that move documents which have not been accessed for a period of time (e.g. 2-3 years) from expensive server space to lower cost media. Different rules may exist for the project/team environment versus the long term 'library'. In the project/team environment, this may even involve deletion, for content not used for several years. Whilst this will save money and help manage the prolific volume of electronic material being produced, it must be underpinned by robust Information Management Processes, outlined above.

### **3.9 Business Initiatives and adding business context**

Taking the EP Business, (principle applies to other business units such as Chemicals, Gas & Power, Oil Products) we have the following:

- Subsurface and Wells (inc Exploration, Development, Well Engineering)
- Engineering
- Production
- Business Administration (inc Legal, Finance, HR, HSSE)

The following 5 pick-listed business attributes have been used by some companies for the Subsurface & Wells division, (concepts apply to the others).

- Project Name (including process step name, phase)
- Product/Document Type
- Asset/Entity Name
- Information Type Keywords (domain subject matter)
- Collection

Although these are not needed by Group Records Management per se, they are needed by the business in order to manage their information effectively. These are the sort of information, for example, that in Microsoft SharePoint would typically be stored in the Business Data Catalog (or Master Data Management MDM). Other EDMS's have equivalents, modules (or use separate catalogs).

In some companies, the Records Management (RM) attributes are linked to these business attributes, so hidden in the background. This enables businesses to become 'RM Compliant' (in this context) by default, simply by using their own systems and approaches (attributes). This is a great way to achieve buy-in.

In some companies, *Global IM assist desks* have been setup which help manage these reference business attributes, through combinations of automated loads and manual requests through a central assist site. Where possible, you want the same functions in different locations, using the same names to describe identical types of information. One of the challenges is describing and agreeing what EDMS content based services are to be offered remotely (globally).

#### **3.9.1 Business Project Name**

Business Project Name has been found to be more important than originally thought, in terms of long term value. The project name can also include the phase as information flows through the classic Identify-Assess-Select-Define-Execute-Operate, value assurance and decision gates process. It's critical to tag records with this for effective retrieval. Nested processes mean that some documents may often be related to several projects. For example, the Well Delivery Project for BT12 #3, related to the Exploration Assurance Process for Prospect Baxter, being appraised as part of Project Boardwalk. It's about ensuring the appropriate contexts are tagged to the document, to facilitate the high precision searches needed by the business both currently and in the future.



### 3.9.2 Product/Document Type

Product Type or Document Types are not new concepts, although they can be radically different in terms of levels of detail. They are generally a level significantly more granular than Record Types (for legal retention), that can exist in information form in its entirety. Examples may include 'Exploration Well Proposal', 'Completion Log', 'Project Assurance Plan', 'VSP Report', 'Prospect Summary Sheet', 'Environmental Impact Assessment', 'CRS Map', 'Field Development Plan', 'Mechanical Wellbore Diagram' etc. They are often hierarchical for classification flexibility and can be known as a *taxonomy*. They reflect the language of the business and have associated mnemonics and aliases.

If Product/Document Types are mapped to Record Types, then you can 'kill 2 birds with one stone' and meet the needs of both the business and records management in one go. These provide the *publishing framework* for the business. If other keyword relationships are automatically pre-defined (inherited) from Product/Document Type and associated with some meaning, then this can be called a simple textual *ontology*.

### 3.9.3 Asset/Entity Name

Product /Document Types relate to what the information *actually is*; Asset/entity type is what the information is *explicitly about*. Common asset/entity names are actual Region names, country names, well names, reservoir unit names, prospect names, field names, block names, license names, pipeline & cable names, survey names, facility names, equipment, site names, vessel names, company/organisation names, software names, and people. These have aliases and unique identifiers themselves that are inherited onto documents to aid retrieval. This information is often called asset reference data (metadata) and is stored in master databases.

### 3.9.4 Information Type Keywords (domain subject matter)

Optional. These can be used in 3 different ways (i) manually picked, (ii) through relations with Product (Document Types) or (iii) automatically as part of a 'knowledge map' for search engine indexing. These keywords differ from Product/Document Types in that they do not exist as 'information work products' in their own right. Information Type keywords can be to do with processes, life & ecology, techniques, problems & solutions, materials, properties, earth features, models, survey or themes etc. They can be particularly important when used to describe digital content which is unable to be full text indexed, or to place increased emphasis on a topic. Where information type terms are associated with each other through meaning, you can create more complex ontologies which can help the system suggest information to the end user<sup>11</sup>.

### 3.9.5 Collection

One of the challenges in producing the document dashboards outlined in section 3.11, is where certain stakeholders need views across processes. Sometimes the collection attribute is needed as the only means to precisely identify groups of documents that the business requires reports on. It is also a logical attribute to group information of various forms from legacy loads from historical systems to help with the maintenance and management of that collection. It may or may not include information held in difference SharePoint instances.

As well as helping retrieval (these attributes are pick lists that come from reference stores that contain aliases, unique ID's and everyday parlance), these business attributes help structure information in the way the business wants it.

Centrally funded growth businesses, like Exploration, can often be one of the early adopters to rolling out Global EDMS approaches in EP. Adoption by businesses with their *own funding* can help embed approaches into specific business processes. So, for example, the need by global businesses such as Exploration to have a 'single approach' to capture and access all its records, can help build a sense of urgency for infrastructure, supporting RM efforts.

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<sup>11</sup> Basic forms of expert systems



### 3.10 Adding business applications on top of the EDMS

One can build or choose commercial applications in various business areas, containing functionality that enhances the generic EDMS in those business areas. Workflow and dashboard functionality in particular have proven to be very effective (see 3.11). Helping projects get handed over from one function to another, one location to another. These applications improve the effectiveness of tracking and capturing the documents so they end up into the EDMS. Typically they are tightly integrated. They are increasingly delivered within SharePoint Portal environments. They also reflect the different needs between the different business lines and disciplines.

### 3.11 Simple Dynamic Document Dashboards

By combining the opportunities, prospects or projects undertaken in each location, with their process status and what has been published on the file-plan, it's possible to track that everything that should be published, is published.



This can be presented through simple automated graphical matrices or dashboards to end users and management (via a single URL).

These are automatically created from contextual metadata and effectively show the records in the EDMS in context to the business.

By keeping the status of their project or portfolio up to date, the business can immediately see where processes, activities or meetings have occurred, but key documents are missing. This brings Information Management (IM) and Business Compliance closer together and enables real buy-in from management. It brings to life assurance process, a checklist to ensure things happen.

The screenshot above illustrates opportunities, prospects and projects on the left hand side (y-axis), colour coded by type, with the business control process along the top (x-axis). Processes that have occurred are green, processes that have been skipped are marked grey. Each cell contains red folders for input documents, and blue folders for output documents, rolled up from any sub-steps. Staff can click on these folders to access the information in the EDMS. Another icon shows the percentage of mandatory records published per step.



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This addresses one of the challenges caused by the use of folders & templates. Many companies have copied folder templates (sometimes hundreds of times) for instances of processes on assets. However, if someone finds an empty folder, does that mean the process has not taken place yet, did not (and will not) take place (so there are no work products), or it did take place and nobody has 'filed' anything yet?!! Blank folders create a lot of ambiguity.

By 'slicing' and dicing the dashboard view, it is possible to present the information on a discipline, process or asset basis. So you can create the impression of 'personalised' or custom built views to different customer sets about their records, whereas in fact you are rolling out a single approach. The dashboard serves the dual process of showing information completeness and allowing an easy interface for end users and management to access their information in a high precision way, without having to either type in search terms or drill down through endless folder structures. They have proved a very effective way to engage the business in my experience.

These metrics are *fundamentally* different to traditional 'Data Management Metrics' which focus on completeness and quality of individual attributes on a database record. Whilst these metrics are useful, they tell you nothing about whether you have safeguarded the actual work products you should have.

Dynamic dashboards can have a real affect on behaviours. If Team leads know that Executive Leadership teams look at these in Quarterly Business Review's, it's surprising what affect this can have and they are so simple. I have seen it first hand. Transparency is key!



## 4. Enterprise/Global Search and Access

Global search engines, GIS/portals etc can expose this information of long term value to different customer sets. It's important to offer flexibility for staff when searching, due to the volumes of information involved:

- Personal/private information (including email)
- Only the working project/team environment
- Only the long term environment 'digital library'
- External information (e.g. SPE, AAPG, I.H.S., Wood Mackenzie)
- All the above in a single search

This is a different architecture than simply allowing users to select which EDMS instances to search.

End users do want simple 'Google like' interfaces. Without going into the detail, as we know there are significant differences between the content indexed by Google on the web and the content inside a global organisation. This makes it challenging for IT functions in large corporations to offer a single search over all their content which offers the 'same finding 'experience' and 'speed' as Google. Google has set high standards for information search! This often leads to most of the effort in a global search deployment going into managing access control and the hardware to handle indexing and search performance. Little attention is paid in each business area, to ensure correct attribute tagging strategies are deployed, acting as Search Engine Optimisation (SEO) mechanisms - allowing staff to find what they need easily by typing a few terms.

The experience companies have had with 'generic' smart 'natural language' smart searches in the oil and gas industry is not a great one. Some oil companies, after extended pilots, have switched these features off. The use of specific functional/domain keywords, taxonomies and ontologies mentioned in section 3.9 can improve searching<sup>12</sup> although there are no silver bullets. In global, complex technical businesses, important information must be identified, ensured it is put in the right place and some context added, otherwise you will never find it. Enterprise search is of course a crucial area. Rolling out a Global EDMS without a way to search globally will frustrate people.

The fact still remains that for many large oil and gas companies, for one reason or another, significant amounts of their critical information do not even end up in EDMS systems. It often remains in whatever project environment teams are using (and can continue to do so, long after teams have disbanded or individuals left the company). This has the affect of creating un-abstracted isolated pockets of information around the place, which in many cases, people do not know even exists.

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<sup>12</sup> Sometimes termed semantic searching