

Information Architecture: An Energy Case Study



Kestral Group

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Overview

Imagine commissioning five different architects, each with the responsibility of building one room of a five room house. Since there is no foundation for the house, each is left to his or her own ideas as to how best to proceed with their room and thus each proceeds with their well intentioned design. Upon completion, the architects are then brought into a room together, for the first time, to assemble their masterpiece. One would not expect a good outcome, but then again, no one in their right mind would ever build a house this way. However, that's exactly how nearly all companies have designed and built their information architectures, via a patchwork of unrelated document and records management deployments. Each group within the company has been given the mandate to go ahead and develop their own information architecture independent of all others so that cross organizational information retrieval, sharing and collaboration is virtually impossible.

The energy industry relies on the quality and availability of information. That information indicates where to explore, where to drill, when added resources are needed to achieve maximum production or even how to resolve an issue in the field. The industry has long been known as an early adopter and leader in the areas of knowledge management and data management as highlighted by initiatives such as the Digital Oil Field. Companies such as Schlumberger, BP and ConocoPhillips are widely recognized for their efforts to maximize the value of their information assets with documented savings in the millions of dollars. In reality, these companies have just scratched the surface of realizing the potential of their information assets.

Are you more confident that you can find useful information within your organization or on the Internet?

Information Architecture is the Core Foundation

A recent study on enterprise search conducted by the non-profit Association for Information and Image Management (AIIM) found that about half of the respondents “agreed” or “strongly agreed” that it is difficult and time consuming to find the information they need to do their jobs.¹ The same study found that 69% of respondents believe that only 50% or less of their organization’s information is searchable online. The lost productivity is obvious, but one needs to ask, why is less than half of any organization’s information available online and even if it was online, would the users be able to find it? What does it mean to put the information online? The key to making information findable by the users is not just putting it online. It begins with a strong system for classifying and categorizing corporate information assets.

There are a number of reasons why users cannot find what they need within a company. The leading problem is a lack of information standards that exist for any given company. Companies have also deployed document management systems as departmental solutions as opposed to infrastructure solutions. As a result, many companies have numerous content repositories, each implemented with

¹ Association for Information and Image Management (AIIM): Enterprise Search Frustrates and Disappoints Users, June 2008

only one internal department or group in mind rather than the entire enterprise. As a result, even if the information was made available online, most people still wouldn't know what to search for. Add to that the fact that the bulk of a company's information typically resides on file shares or on employee PCs with virtually nothing to define a document's content except the title and it begins to become clear why companies are facing a major challenge with regard to their information architecture.

Metadata Standards

Information architecture must take into consideration not only how people search for information (e.g. documents, spreadsheets or drawings), but also how they describe it. The term that people use to describe content is commonly referred to as metadata (often defined as data about data). For example, the string "80202" doesn't mean much unless one knows the context of how it is used. When one applies the label "Postal Code" to the string, it now has a meaning that is clearly understood. Thus, "Postal Code" is the metadata that is requested of the user who then enters "80202."

Metadata is a foundation element of a document and records management program. When applied consistently, metadata facilitates the user's ability to find that content they need when they need it. In addition to standardizing the terminology, it is important that when possible, the choice for those metadata elements comes from a predefined list of options commonly known as a dropdown. For example, if a company wishes to track the status of a document, the choices for the status should be presented to the user as a definitive list from which to select such as:

>	Approved
	Archived
	Draft
	Issued for Approval
	Reference Only

This eliminates the potential for user error such as a "typo" and improves data quality and findability. It also facilitates the process of adding metadata to the document, often referred to as tagging the document, by allowing the user to click on a menu item rather than typing a string thereby shortening the process. Benefits of metadata standards include:

- Improved enterprise search results
- Improved data quality and consistency
- Facilitated application integration through common data definitions
- Improved collaboration through common categorization and classification
- Improved and consistent classification of knowledge assets

Folder Structures and File Plans

Traditionally, documents have been stored in folders which were stored in file cabinets or boxes which were stored on shelves in file rooms. People searched for those documents based upon the knowledge of how the documents were categorized. For physical documents (paper-based), not much has changed. Browsing hierarchies or folders is one method of finding information to which we have

become accustomed. Users still store their documents in hierarchies of folders for the same reason which is to help with retrieval at a later time. The problem is, unless the user created the folder hierarchy, they are not likely to know what exists within it. It is unfortunate, but this is the fate of most company's electronic documents. Because most information exists within file shares, it has little or no metadata associated with it. The fact that there is little logic that went into the creation of the folder hierarchy of the file share only compounds the problem of finding the information held within. It is not uncommon to find folders such as "Tom's Folder" within a file share and only Tom knows what that folder holds. If Tom is no longer with the company, call that information lost, no matter how valuable it is.

Folder structures are not always used, but when they are, a standardization of the structures should be promoted. Standardization improves the user's ability to find what they want by allowing them to browse through the folder hierarchy. Other benefits include:

- Reduced learning curve as employees transfer locations
- Information can be grouped by asset or legal entity to facilitate the acquisition or divestiture process
- Facilitated and consistent application of security across folder structures
- A consistent vehicle for the inheritance of data from the folder to the content that resides in the folder, resulting in reduced time taken to tag the content and improved data quality
- Facilitated compliance

When incorporating a Records Management (RM) program, the File Plan is designed to reflect and manage the record lifecycle. To the user, the File Plan is a hierarchy of containers (virtual folders and boxes) which are used to classify and categorize corporate records both by type and lifecycle.

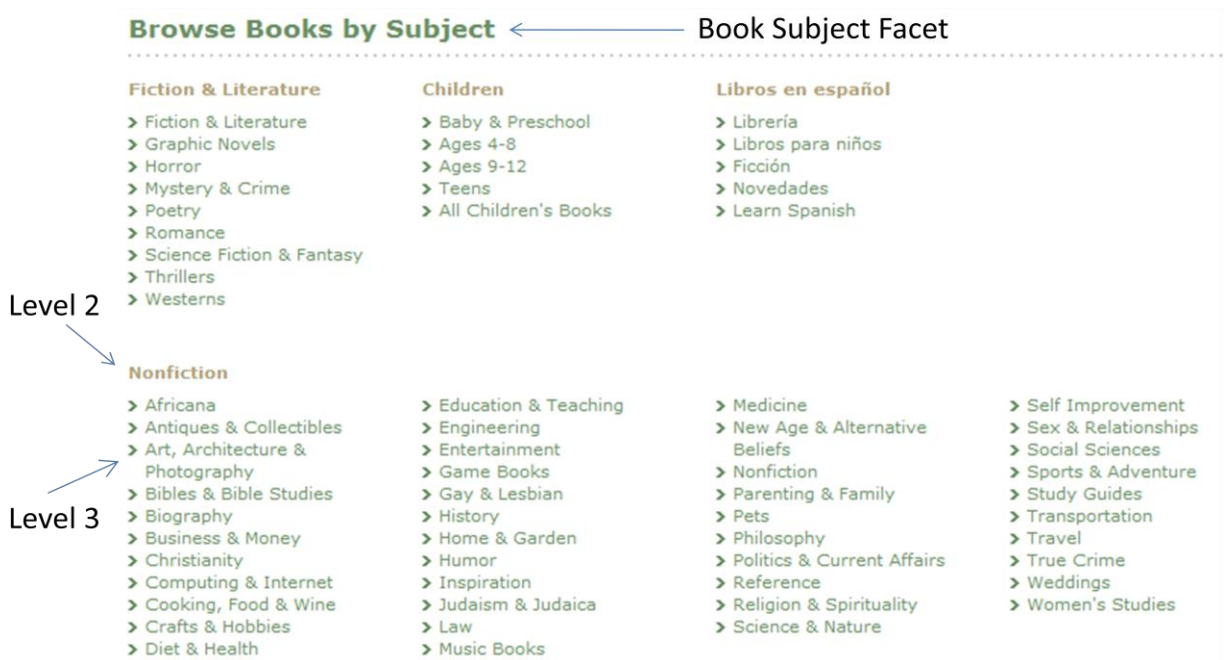
The Thesaurus

Within every company, and within every industry, there exists a specific language that is shared by the people who work there. That language consists of unique acronyms and terms that are common to the industry or company. In most cases, the terminology used within the company will also be used within the various business applications. The simple use of a thesaurus can greatly facilitate how users search for information without necessarily having to know the exact terminology used when the information was captured in the first place. For example, when a company is acquired, the terminology used by the acquired company can be quickly mapped to enable users to search using the terminology used by either organization to get to the same result.

Faceted Classifications

A diamond is typically cut such that each of the facets (surfaces) of the diamond provides a brilliant view of the overall stone, yet each view is separate and distinct from the other views of the same stone. The stone can have many facets, but in the end, each facet still provides a view of the same stone. In the Enterprise Content Management (ECM) realm, faceted classifications provide the same functionality, but instead of a stone, we have a document or other object that is classified.

In the examples below, faceted classifications are used by Barnes and Noble book sellers to allow users to browse their books by multiple faceted classifications. The two classifications used on the example are Subject and Price. In the diagram below, Subject is the top level of the hierarchy. The second level is comprised of the categories Nonfiction, Fiction & Literature, Children, and Libros en Espanol. As shown below, a user who selects Nonfiction as the second level of the hierarchy would be required to select from the third level in order to narrow down their results. This example shows Art, Architecture & Photography as the third level.



Source: Barnes & Noble

Figure 1: Example of Faceted Classification by Subject

In the above case, the user has selected Subject>Nonfiction>Art, Architecture & Photography to categorize the book. Faceted classifications allow users to intuitively browse for content by categories. Below is an example of a multi-faceted browse, again from Barnes & Noble booksellers. The two faceted classifications are Subject and Price.

Art, Architecture & Photography

browse
Art, Architecture & Photography

- Bestsellers
- New Releases
- Coming Soon
- Bargain-Priced Books

More in Art, Architecture & Photography

- Architecture
- Architectural Time Periods & Styles
- Art - Fashion, Decorative Arts & Design
- Art - History & Criticism
- Art - Styles & Periods
- Art - Techniques
- Individual Artists
- Individual Architects & Buildings
- Photography

Price Range

- Under \$10
- \$10 - \$25

Turn Right at the Serf's Hovel
Winchester Cathedral, You're Bringin' Me Down



The Gothic Enterprise
by Robert A. Scott
(Paperback)

\$17.95 Online Price
\$16.15 Member Price

[Add to Cart](#)

[Add to Wish List](#)

What's So Gothic About Gothic Cathedrals?

Oh, how you wished you had had this book when you were standing awestruck but ignorant in the Cathedral of Chartres. But this is no dry-as-dust architectural guidebook; it tells you how and why the great churches were built, who built them, and what they meant to medieval society. Popular scholarship on this level is rare indeed. And if you read and enjoyed Ken Follett's bestselling evocation of the Gothic world, *The Pillars of the Earth*, this book should be next on your list.

Snap, Click

The Moment It Clicks
by Joe McNally
(Paperback)

\$54.99 List Price
\$38.49 Online Price (save 30%)
\$34.64 Member Price

[Pre-Order](#)

[Add to Wish List](#)

Ciao! - El Lider Máximo



Fidel Castro
by Luciano Garibaldi
(Paperback)

\$30.00 Online Price
\$27.00 Member Price

[Add to Cart](#)

[Add to Wish List](#)



If Freud had met Fidel Castro, he might not have said that sometimes a cigar is just a

Figure 2: Example of multi-faceted browse with Subject and Price classifications

Complete information architecture must take into consideration all aspects of how a user will interact with content. It is no longer enough to consider simply how the creator interacts with the information, but rather how the information can be used throughout the enterprise. That means a strong understanding of the metadata, the location where the information resides, content security and what methods are available for the users to access the content. Only by taking a holistic approach will companies be able to realize the full value of their content. The examples below highlight the value of well designed enterprise information architecture.

The Information Architecture Impact on Social Networking and Collaboration

The explosion of social networking sites such as LinkedIn and Facebook are great examples of the power of networked social interaction. Users create their own profiles or sites that incorporate information about themselves including blogs, Wikis, lists of their favorite things, pictures, and even applications which allow them to communicate with their peers through messages and email. In addition to the social aspects of the software, there are strong business applications as well. Technologies such as SharePoint from Microsoft and Lotus from IBM are experiencing explosive (some may say viral) growth.

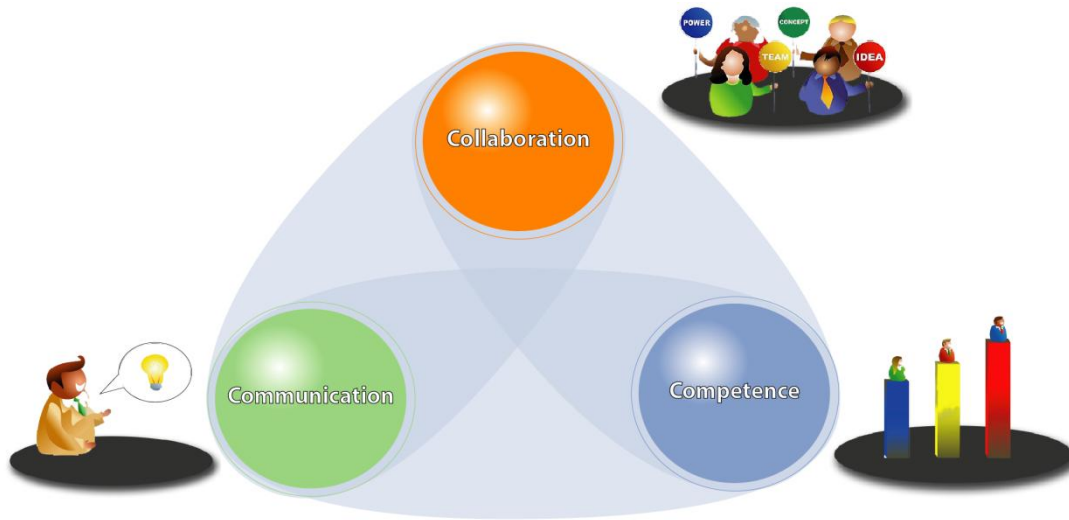


Figure 3: Social networks can greatly improve communication and collaboration

Are companies using social networking software for team and project collaboration and knowledge management solutions because of the ease of deployment? That is one reason. Another is that users are frustrated in their inability to find the information they need within the company. The end result is that users stockpile copies of information they find to be useful and, through the social networking tools, invite peers to share and collaborate. This duplicate information exists outside of the company's compliance initiatives and exposes the company to risk while also driving up costs related to physical and electronic storage. The unwanted result is that these networks can become silos of collaborative information that is not shared within the company. A lack of standardized information architecture compounds the information silo problem with each new site that is created. With the number of SharePoint sites reaching well into the thousands in some companies, the initial gains from improved collaboration quickly give way to the high costs related to compliance, storage and the compounded problem of information silos.

With a common information architecture, all content captured shares the same foundational elements. Information captured on one collaboration site is consistent with the information that is captured on others. Information available from one collaboration effort is available to other similar collaboration efforts that may exist in other areas of the company regardless of where in the world those efforts may begin. The end result is that fewer collaboration sites are required expanding the social networks to be true centers of expertise. Instead of single silos of networks that are unaware of any other effort, it is possible to have networks of networks that each share a common thread. In this way, centers of expertise in the United States can collaborate and share with centers of expertise in Asia and Europe using a common language.

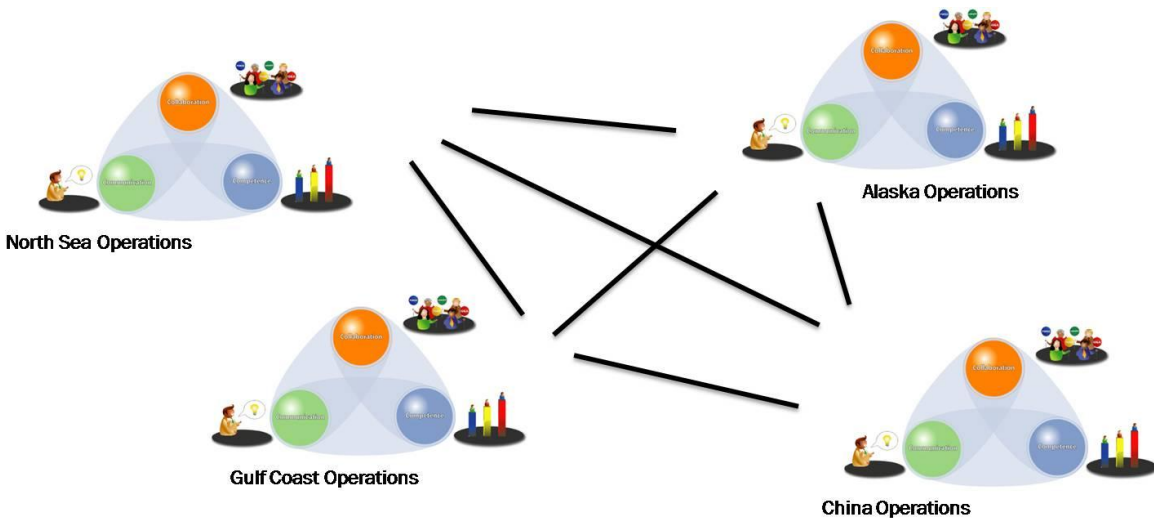


Figure 4: Information architecture standards bring social networks together

Information Architecture and Capital Projects

In the energy industry, large scale capital projects are a fact of life. Whether building an offshore platform or a pipeline, the costs can range well into the millions of dollars and even billions in some cases. These projects are quite complex requiring considerable effort from numerous suppliers and partners, each responsible for their own piece of the puzzle. It is up to the Capital Projects group to manage all of these various parties and consolidate all of the information into a cohesive library of design information that includes policies, procedures, design drawings and safety information. The challenge of bringing together suppliers, often from different countries and with different standards, can be rather daunting and the costs extreme. For many organizations though, this is just the start of the problem.

Just as the Capital Projects group must contend with creating a cohesive design from the widely disparate information they receive, they must also present that information to their customer, the Operations groups that will own the ongoing maintenance and support of the new asset for the remainder of its lifecycle. Because of the continuous acquisition and divestiture within the industry, it is not uncommon for the Capital Projects group to deliver to each of the various Operations groups within the company in a unique way. What's this mean to the average energy company? The costs of simply turning over the project documentation to the Operations group can range from 6 to 14 percent of the overall cost of the project. For a multi-million dollar project, those costs add up very quickly and anything that brings down those costs can provide for substantial savings to the company. Applying a standard information architecture can greatly reduce the cost of turning over project documentation to the Operations groups, but it also can impact safety and quality as well.

Metadata Standards Lead the Way to Data Consistency

The amount of content generated over the course of a complex capital project is significant. The easiest way to drive down the costs to create and maintain that content is by standardizing the information architecture that is used by the various content creators and consumers, both internal and external. The Operations groups are the ultimate customer and must be consulted on the information that is required for them to maintain their assets. Through the course of the project, considerable information is gathered from the various partners and suppliers. Providing those partners and suppliers with a standard that dictates what information is required and how it must be formatted saves everyone the time and effort required for the rework that is typically needed to meet the shifting needs of the end-user.

For example, if each vendor and supplier has their own method for describing the status of a drawing, the time and effort needed to manage the change process would be greatly increased. Users looking for documents with a status of “As Built” may not find documents with a status of “Issued for Construction.” The terminology used to describe the system to which the drawing belongs may differ from what the operations group uses thus increasing the amount of time spent to reclassify the drawing for the Operations group. Standards for elements such as discipline, drawing/document number, facility, status, and even document or drawing type can decrease the cost of turning over project documentation.

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Benefits of the standardized information architecture for Capital Projects include:

- Improved project communication with suppliers and vendors
- Decreased cost of content turnover from Capital Projects to Operations
- Improved project controls and reduced project costs due to rework
- Facilitated project document reconciliation
- Facilitated compliance with corporate records policies
- Facilitated reuse of project templates for similar projects

About Kestral Group

Kestral Group utilizes real world experience to help our clients deploy successful enterprise information management solutions including Enterprise Content Management, Compliance/Records Management, and Collaboration. The company helps clients realize the value of their information assets by accelerating the deployment of new and existing solutions, and expanding beyond departmental solutions to drive broader business value. Kestral Group’s consultants have helped clients including oil and gas super majors, service companies, midstream and national oil companies around the world.

About the Author

As the President of Kestral Group, Michael Elkins has over 17 years of real world experience helping companies around the world, both large and small, with the design and deployment of successful enterprise information management solutions. Prior to founding Kestral Group Michael has held a number of executive and consulting roles with companies including Schlumberger, Convergent Group, and FileNet. Michael has successfully developed and implemented corporate information management strategies combining Knowledge Management, Enterprise Content Management, Records Management, Information Architecture and Enterprise Search technologies for global clients. He has a bachelor's degree in Computer Science from West Virginia University.