

Publications

Process Analysis Leads to Improved Data Management Selection and Implementation

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ABSTRACT

With the growing volumes of E&P data and the multidisciplinary users requiring fast access to quality information, there is a need to focus on the work process and how that process must change in order to provide effective access to available data stores. Understanding human resource requirements, discovering the needs of the data consumers, and identifying the tools that provide each user group with the best support for making informed judgments must be considered when evaluating IT solutions for enterprise-wide data management.

BACKGROUND

As technology improves and competition increases, we are having to consume more data with fewer people. There is a greater need for multidisciplinary users within asset teams to access accurate, quality information, quickly. The good news is that the information is becoming more readily available, but we need to continually evaluate how we provide access to the data consumer to ensure that we're working as efficiently as possible. A team-oriented approach called Process Analysis effectively enables E&P companies to understand the growing needs of the data consumers, adjust human resource requirements when necessary, and enhance performance and productivity among all user groups.

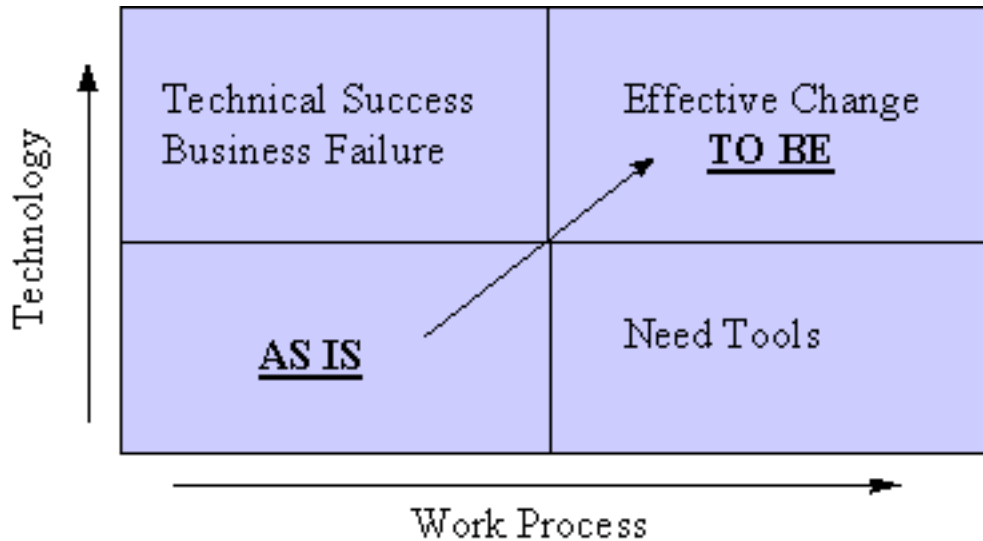
Well log management often rises to the top of the data management heap. This data is often required by all technical disciplines throughout the life cycle of the asset. The applications of choice vary by discipline and often run on different platforms. Therefore application and platform independence are important features to pursue so that we do not put technological barriers on the users. Emerging technologies and related computer applications must remain open to a more technologically savvy user-base.

Furthermore, an inordinate amount of time is spent searching for data. Using a process analysis approach, companies can learn how they can work effectively. This may be through new technology, staffing changes, and/or training, data capture and storage and retrieval processes.

PROCESS ANALYSIS

Figure 1 shows a diagram that depicts the path required to achieve effective business process change. Effective change is accomplished by considering components of technology adoption as well as components of workflow adjustments. In order to build and an effective road map to change, one must first understand the current state, technologically and practically. This is called the "As Is" state. Next, the future desired state is developed, which is called the "To Be" state. With these two pictures defined a set of initiatives can be developed to migrate from the "As Is" state to the "To Be" state. The most critical aspect of the process analysis approach, however, is the engagement of the key stakeholder, or users, that are involved in the business process.

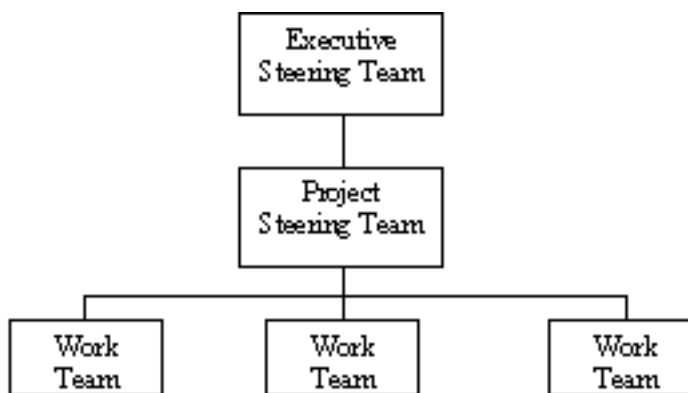
Figure 1 - Path for Effective Change



Project Team and Charter

The Process Analysis project begins by establishing a project team and project governance. Our approach uses a vertical governance structure and a horizontal involvement of people as depicted in Figure 2 - Project Governance. The Executive Steering Team provides sponsorship, funding, and guidance. The Project Steering Team is comprised of departmental managers and the project leader. They steer the actions of the work teams. The work teams provide the raw input for the project.

Figure 2 - Project Governance



Broad involvement is critical within the work teams. The process analysis approach and governance structure ensures engagement of the stakeholders across the horizontal workflow.

"As Is" Process Mapping

The Project Team works closely with a broad representation of the company. The Team seeks the input and recommendations of the people actually responsible for the work, thus getting their buy-in. Furthermore, by involving the front-line people, we begin to get them accustomed to the idea of changes within the organization. Normally, people are wary of change, so it's an important first step to get the front-line people on board early, and when they

participate in the process, it generates an excitement and interest. Finally, of course, Project Team members get valuable, firsthand feedback from the people who best understand how their jobs currently work.

Brainstorming

In order to obtain broad user enrollment, the Project Team holds brainstorming sessions with key employees to find out about how the company currently works - how data administration works with geoscientists, how and where the data is stored, what systems people use and how they get to the data they need. All of these are examples of what the Project Team might uncover about a company, and team members "map out" the input, using yellow stickies and taking copious notes.

Issue Themes

Once the map is created - and it is literally a map of how the company works - the Project Team can easily spot problem areas within the organization. Multiple platforms running multiple software, for instance, can easily be seen as a challenge when it's shown on paper. Incidentally, Process Maps are often as long as 8 ft., and they should be hung in a common area, where employees can add to it when they have new ideas or suggestions.

Typical issues that arise are problem with access to available data, data quality, multiple source formats, data versioning, undefined procedures, and application and platform conflicts.

"To Be" Process Mapping

1. Initiative for Improvement

Armed with the information from the brainstorming sessions, the Project Team drafts a "To Be" map. Much like the "As Is" map, the "To Be" map shows the ideal inner workings of a company - everyone working to full potential without the old problem areas that bottlenecked the system and slowed down the company's efforts. The "To Be" map should demonstrate how the company can increase productivity, save time and, of course, lower costs. Common initiatives might include the need for a common user interface to multiple, distributed data sources that is accessible from any computing platform and flexible, yet integrated data loading capabilities of a variety of data types (vector data, images, etc.). Additionally, the need for a qualified staff person dedicated to the task of data coordination is common. This may require, in some cases, a change of philosophy by management to understand the critical nature of that task. Training is always a common issue when it comes to technology adoption and integration.

2. User Validation

The "To Be" map, however, is not entirely complete until the Project Team unveils it for the users. The users should be able to see how their input and, more importantly, their jobs, fit into the new process. As stated earlier, user validation is crucial in any company.

Technology Selection

After process mapping is complete, we continue the Process Analysis of the company by selecting the technology necessary to make improvements. We look at the infrastructure existing within the enterprise and consider the technology philosophy of the company. Given this foundation, the technology inventory from which a solution will be based is established.

There could be many technology alternatives for any given company. We might recommend a web-based interface for accessing databases that doesn't require

the distribution of software, and that promotes a simplified system management. Whatever we select, we need to make certain it will do the job outlined in our "To Be" map. Moreover, at Petris we're careful to consider our client's corporate philosophy because we want to make certain we remain within the framework of the company's culture. For example, for some companies, outsourcing is the best solution for data and systems management, but for other companies it's out of the question.

Common Issues and Initiatives for Improvement

Consistent Data Collection

There are several Issue Themes that E&P companies commonly discover through Process Analysis. The first is inconsistent data collection, often the result of insufficient human resources. All companies need to ask themselves, "Who's minding the store?" We need to realize the importance of every job function within our organization, and make certain that each person has assumed a clearly defined role. In the area of data input, loading and storage, we need a qualified technician, or "Data Coordinator," who serves as an expert on the system or systems we use, and who can funnel the data to the appropriate place. This individual should be the "point person" for the data our company receives, utilizes and stores, and we should make him or her an integral part of what we do. Commitment to allocate the qualified resource is essential. A Data Coordinator should be knowledgeable of the data, data formats, user applications, and user needs. This will provide the users with a level of confidence in the data that will free him to perform the value-added work that the user is expected to perform. Training the Data Coordinators on the implemented systems and the established work process will position the Data Coordinator for success.

Central Source for Information

A second common Issue Theme uncovered by Process Analysis is that companies have a need for a central source of information. We find that the E&P computer-aided tools are being used to store the data within a "project" framework. The data within these projects is associated exclusively to the projects and are not searchable outside the defined project. We have developed a metadata framework that can be used to stage the raw data, control the edited or interpreted data and warehouse entire project data sets.

We also find that certain disciplines within the project team use tools that perform best for their specific needs. For example, a geophysicist might work in a UNIX environment with Landmark's suit of products, whereas the geologist may prefer working on the NT platform with Mincom's Geolog product. The engineer will work with Windows-based applications such as Merak's suite of applications. Several problems arise from this platform and application disconnect. First, the user's familiarity with all the application environments is impossible. Second, each discipline has unique ways on searching from information; geophysicists and geologist prefer performing spatial or regional queries and petrophysicist and engineers need well-based search capabilities. Third, the region in which the professionals are working places special requirements on query formulation. A common user interface that meets the needs of each discipline and is smart enough to adjust it's search parameters based on the geographical region being searched becomes key initiative.

The interface to each data store must be independent of the applications and the project databases. We implemented a web-base interface the provides access to multiple, distributed databases through the metadata framework.

Documentation of Raw, Edited, and Interpreted Data

Another Issue Theme that is common to most companies is the disposition of edited and interpreted data relative to the raw or source data. Many times the

raw data will reside off-line on diskette or tape while the edited and the interpreted data will reside with the application's projects. Here, the other disciplines within the project team do not have easy access to the interpretations of others or may not have knowledge of its existence. If the data is requested by another the data must be extracted from the application and copied to the requesting member. Formatting now becomes an issue and time is spent dealing with the associated complications.

If the interpretations are captured, then identification of the 'version' becomes an issue. The geoscientist loses confidence in the data when information about what has been done to the data, by whom, when, and why is not available. We recommend a versioning methodology that provides for identification of the interpreted versions of the data within the metadata model. The raw data is maintained as the source.

Common Access to All Data Sources

Common access to all data sources is an emerging problem area. New complex data types are complicating the data management picture. We have seen the use of images becoming important to the E&P community. As a result awareness of the problems that exist in the management of this information is increasing. The metadata model that we have developed provides access to this kind of information as part of the whole solution. The metadata model provides a view into the various data sources, whether they are file-based or in a relational database. From this high-level position, we are able to manage the data in the most appropriate manner for that specific data type while not hindering access from any platform, from any site (local or remote).

Conclusion The Issue Themes that have been presented here are a sample of part of a very significant challenge. E&P organizations must commit to addressing the challenge, and gaining the enrollment of the users is critical for success. Process Analysis is an excellent tool with which to identify the challenges and to evaluate a reasonable and practical solution. Process Analysis may sound like therapy for your company, and that's not a coincidence. By looking at how your company operates now and analyzing what's really wrong with it - often things that may not be readily apparent - we're able to make the kind of changes that result in a more productive workplace and, therefore a healthier bottom line.

Frazier, Joseph 1998. Process Analysis Leads to Improved Data Management Selection and Implementation. Proceedings of the 2nd International Conference on Petroleum Data Integration & Management.

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