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Featured Article

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NEW TECHNOLOGIES PRESENT OPPORTUNITIES FOR PIPELINE ASSET MANAGERS

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INTRODUCTION

Everyone in the Oil & Gas Industry knows that we are in the business of moving product from the ground to the consumer. This is a very complex process that requires many events to happen in the right place, at the right time, and in the right way. Many of these events involve numerous people, each potentially with different desires, needs, and opinions. It can be a very risky and costly process. Our job is to make each of these events in our business happen as effectively and efficiently as possible.

A business process is simply a chain of events to provide value. We have all heard that a chain is only as strong as its weakest link. We also know that if a chain is too long or too large, it will be a heavy burden to carry around. In a perfect world every chain would be the perfect material, the perfect size, and the perfect length for the job.

In the field, we have many chains that are made specifically for a single task, and we have many of them that are built larger and longer than needed so that they can be used for several tasks. This requires of course, that we carry these heavy chains with us everywhere and this can be burdensome and costly. We also have chains in the office and here is where we can see a parallel between the physical chains needed in the field, and the logistical chains needed to support business event processes.

In the Oil & Gas business we have hundreds of event process chains, each of which bears a cost and contains certain elements of risk. So what can we do to reduce our burden and improve our business? Let's take a look at the current state of affairs and then have a look at some new technologies that may offer us an opportunity to improve our lot.

THE OIL & GAS PIPELINE INDUSTRY–CURRENT STATE

North American Oil & Gas pipeline companies have been around for over one hundred and fifty years, and the basic process of extracting, gathering, refining, and shipping oil has not substantially changed. The basic equipment used in this process is essentially old technology that is much improved. To a degree, the old saying "If it ain't broke don't fix it!" has shaped much of what we see as business practice today. Often, we try to reduce risk by not changing what we know works and this approach has led us to be slow to embrace technologies that we don't yet understand or that we perceive as potentially disruptive. Thankfully, with technological changes now pervasive in all of our personal lives, we are aware of the potential opportunities that technology brings to us. Still – it may take a major event to drive us to change what we do, and we must see that the benefits of these changes outweigh any perceived risks associate with them. We are experiencing one of those major events today with the dramatic drop in the price of oil.

The Effect of Falling Prices on the Business

The immediate reaction to falling prices is to institute hiring freezes, cut exploration budgets, defer lesser value projects, and generally focus on cutting costs throughout the enterprise. In the longer term, aggressive companies will see an opportunity to acquire smaller operations or acquire assets at distressed prices. Others will look for innovative ways to reduce their cost structure, reallocate or consolidate resources, and generally make improvements that were waiting for resources to come available.

Business Gaps and Areas of Improvement

Making improvements is not hard if you understand where your pain points are. For busy firms, it's hard finding the time to re-engineer a business process that may be seen as less important than making production and delivery schedules. In this case, gaps in the existing process are generally filled with work-around fixes that may persist for years and become very entrenched. One must view a downturn in the business as a good time to take an introspective look at the business and give it a good tune-up. Let's look at some business areas and identify a few that may provide an opportunity for improvement.

Construction Activities

Pipeline construction is a global activity and new construction conflicting with existing utility and pipeline infrastructure is a major issue. The ability to share critical information on existing assets can be substantially improved.

Inspection Activities

Inspection to ensure that the work conforms to the engineering and design specifications and that the job is properly documented are critical elements of any project. The daily inspection reports, weld reports, and sign offs, are generally paper-based. Job photographs, progress reports, timesheets, goods and services receipts, etc. are often not available in real or near-real time, which produces lags in the timeliness of information that may be needed to properly manage the project.

Maintenance Activities

Maintenance is another area where, over the last twenty or thirty years, there have been vast improvements. Generally items relating to work order management, budgeting, and scheduling activities. There are still major issues in transferring information to and from the field in a timely and cost effective manner. Many maintenance activities still rely on paper-based processes. These

processes may involve the printing and distribution of forms that are filled in by hand in the field, to be submitted to the office for manual entry into a database to complete the process. These types of processes take a long time to complete, are costly, and error prone. These types of processes need improvement.

Regulatory Compliance

Another area of improvement relates to regulatory compliance requirements that dictate what we can and cannot do as a business. More and more, people are getting involved in the regulatory construct and influencing decision makers, especially at the political level. Businesses need to ensure that every one of their employees and contractors understand their part in ensuring compliance. They need to ensure that they are compliant and they need to be able to demonstrate this compliance to Regulatory agencies. Spending weeks or months to pull together the paper trail to demonstrate compliance is another area needing substantial improvement.

NEW TECHNOLOGY

Technology is pervasive in our lives. We now do vast amounts of business using new computing technologies. Only forty years ago, we had to physically go to our local bank where we would queue up to see a teller and hand them a passbook where our transactions were recorded. The mere act of making a withdrawal meant waiting for a bank to open, driving to the bank, waiting in line, performing the transaction, and then driving back. Now with current technology, banking takes seconds using mobile and cloud-based technologies, and no one thinks twice about it. Technology has totally transformed how we do our banking. It has the potential to transform some areas of the Oil & Gas business too. Here are a few examples.

Precision GPS Receivers can now produce survey grade maps at less than a tenth of the cost of traditional surveying and enable the display of this data in a real time via Bluetooth connectivity with a mobile device.

Bluetooth Capable Location Tools can communicate with handheld computing devices to capture location information and integrate it with GPS information to produce highly accurate electronic maps of underground infrastructure.

Mobile Computing Devices – Rugged computers and mobile devices such as tablets and smartphones allow the capture and dissemination of information in real time. Today $1,500 will get you a rugged tablet that can be dropped, submerged, subjected to extreme temperatures, and keep on working. These devices will bind the GPS and Location tool information and send it over a secure network to the portal where it is used to update the project database.

Cellular Communication Networks provide unprecedented communications between the field and the office. Data and information sharing has never been easier.

Radio Frequency Identification "RFID" Tags provide access to specifications, maintenance records, installation information, and location (track and trace) history. Because the information is bound to the physical asset there are no concerns about associating the wrong records to the asset. Data held in the RFID tag could be used to auto-populate forms and inspection reports and eliminate the chance of errors introduced by manual data entry.

PROCESSES AND STANDARDS

It is not only technology, but also processes and standards that will help drive positive change.

Subsurface Utility Engineering (SUE) as a discipline was created to support construction and maintenance activities on linear assets. SUE is intended to improve the knowledge base prior to the start of construction in order to reduce redesign and delays due to conflicts with existing assets. Incorporating SUE into the Engineering and Construction disciplines is one area that will bring major benefits to the business.

Open Geospatial Consortium Standards allow the sharing of information regardless of the source system or software used to create the information. This allows for plug and play data sharing and will be a major benefit to data integration during mergers and acquisitions.

ASCE Standard 38 "Standard Guideline for the Collection and Depiction of Existing Subsurface Utility Data" is a project-driven

standard that ensures authoritative and risk-based data for location of assets.

CSA S250 "Mapping of Underground Utility Infrastructure" is a mapping standard for exposed utility infrastructure that ensures data exchange and interoperability.

CSA Z247: "Damage Prevention for the Protection of Underground Energy and Utility Networks" assists Operators in standardization of their regulatory responses to "One Call" issues.

THE REGULATORY LANDSCAPE

Regulators have legislation in place to provide the basic framework for governing Oil & Gas pipeline operations, and they continue to provide opportunities for the public to convene and verify that their safety and environmental needs are met. We have recently seen the impact of some major incidents that have caused the public to take more notice of pipeline operations. The loss of goodwill caused by these incidents has been substantial. Public pressure on regulators coupled with the pervasiveness of social media and one soon understands that the Oil & Gas Industry is in the public eye like never before. Certain groups like the NIMBYs (Not In My Backyard) and the BANANAs (Build Absolutely Nothing Anywhere Near Anything) have an unprecedented ability to affect public opinion and sway regulators and legislators. More than ever, we need to be completely transparent in our dealings with regulators and the public. Measures are underway on several fronts to improve this situation.

Regulations relating to how businesses operate will likely change. It has been suggested that legislators will eventually enact laws that make the standards of care that have been crafted by the Standards Committees mandatory. This will have an immediate and profound effect on the Oil & Gas Pipeline business.

CONCLUSION

Advances in technology have presented the Oil & Gas Industry a new set of tools to provide improved management and access to critical information throughout the enterprise. The recent changes in the market have provided an opportunity to review and refine current business practices and use new technological tools to support much needed business process improvements. Those firms that seize this opportunity will be able to improve their ability to share this information with stakeholders in real-time, assure safer operations, and ensure compliance with regulations. The reduction of manual data entry and the ability to review data entered in real time makes the information more timely, accurate, and reliable, reduces costs and risks, and improves the bottom line. ■

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