INNOVATION TO IMPLEMENTATION: E&P EVALUATIONS FROM THEORY INTO PRACTICE

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ABSTRACT

Chesapeake Energy (Chesapeake) has transformed their approach to managing subsurface opportunities and technical work across the enterprise by leveraging new technologies and embracing a culture of digital collaboration. They recognized a need for increased consistency in the collection, evaluation, and assessment of all technical work generated by subsurface teams across the enterprise and proactively created digital spaces to capture work and share learnings.

Managing information within an E&P company can be like trying to put out a forest fire with a garden hose. Over time, the sheer volume and complexity of the data being collected and managed has increased exponentially while the software, tools, and methodologies to tackle them have remained the same. Very often, the modern problems in managing large amounts of structured and unstructured information are difficult to successfully overcome using outdated technology.

Chesapeake has developed a centralized, common platform with customized and integrated applications to help in the communication, visualization, reporting and tracking of all projects from the Exploration, Geoscience Technology, Risk Consistency, and Reservoir Technology groups.

Several benefits have been achieved and are distinctly evident from the now named *Pegasus* system. These have included:

- Clarity of expectations on technical deliverables
- Standardized dashboards for tracking and capturing project status

- Centralized, singular source for technical guidance and tracking of all project data
- Ability to easily compare, rank and evaluate all projects
- Real time ‘line of sight’ into the health of the business at any point in the evaluation process or project status
- Aids in the communication between the senior management and technical teams
- Workflow standardization across the various cross-disciplinary teams
- Enterprise views of all projects
- Knowledge shared across all projects
- Identification of resource constraints and project priorities

This paper describes Chesapeake’s approach to solving these challenges from their initial scope and vision, implementation, results, lessons learned, and problems solved.

By leveraging innovation and technology within the business, Chesapeake has significantly advanced their strategic goal of achieving consistent, technical excellence across the organization.

INTRODUCTION & BACKGROUND

Managing information within an E&P company can be like trying to put out a forest fire with a garden hose. Over time, the sheer volume and complexity of the data being collected and managed has increased exponentially while the software, tools, and methodologies to tackle them have remained virtually the same.

The speed in which the data needed to be collected, managed and repackaged for decision-making was slow and inefficient. Too much time was being spent on repetitive, tedious, manual and nonproductive processes to consolidate information from around the organization into consumable material for leadership and decision makers.

Chesapeake needed a way to leverage technology that would drive actions to create the most value. There needed to be a better method of ensuring the proper tracking of project deliverables and subsurface risk assessment while facilitating the collaboration, sharing, and visibility of technical excellence and knowledge. This technology needed 'just enough structure' to support decisions and analytics, but not restrict creativity and be easy to use.

Every journey begins with a first step, so in late 2017 Chesapeake set out to change the way they work by building tools to help achieve these business goals and vision. Chesapeake employees are driven to generate the most value for the company and the key to enhancing this value is through good project execution and making the technical work more efficient.

BUSINESS NEEDS

The business of finding and developing prospects involves the consolidation of many different disciplines, data points, interpretations and information into one integrated view of the prospect. Information about these prospects was typically stored and retained in an unstructured, ad hoc manner within presentations, maps and papers with key decision influencing information in numerous PowerPoints, shared drives or spreadsheets. The greatest business driver came from the need to create a structure of unstructured information supporting the way Chesapeake works so that the decisions about a prospect could be made in a timely manner.

WHERE IS THE INFORMATION?

Optimizing decision routines and operational efficiency can only happen with high-quality data in a consistent format. The high cost of not finding information in a timely manner led to lost productivity and time wasted searching, lost opportunities, duplicate work effort and the reworking of information for limited use.

The first question that had to be answered was, how is the business managing the information it relies on to drive value? As the volume of data, tools, and people grew over time, the spreadsheet tools that had previously been relied on to manage it all quickly became ineffective and obsolete. It became apparent that the decision-making abilities were limited by the speed at which the relevant information could be collected and managed.

Working on the Right Stuff?

There are always more items on the team's to-do lists than there is time to do it, so how do teams know that they are working on the right stuff at the right time? How do individual contributors know that the time they are spending on a project is bringing the most value? How do you know they know that the opportunities in front of them are the best ones to be working on?

Now, expand and magnify that from leadership who are responsible for managing individuals or an entire group, organization, asset or a company. How do leaders understand if their people are working on the right stuff? How do they show them what to do and the importance of it? How do they explain to others in the C-suite that their subordinates are working on the right stuff? How do they visualize that and explain it to someone else in a logical, consumable manner?

Measuring & Tracking Progress?

If there isn't a standard, how is progress or improvements measured? In order to measure progress, there needs to be a baseline in the business planning process from which to compare back to that standard. Is there a defect in the process? If there is, then adjustments and controls can be set to fix the bottlenecks and monitor the impact to the process progress measurements.

Tracking the Real Time 'Status' of Value Generation in the Business?

How often is the progress or status of the value-generating activities of the business measured? How are these captured, recorded and retained for future comparison? What is the current state of the business, and how much progress has been made?

It was critical to figure out the dependencies in the operating rhythm for each of the target organizations to use Pegasus, with each of the departments operating on a different business rhythm. Exploration has a longer operating rhythm spanning weekly to monthly to quarterly, while the Geoscience and Reservoir Technology groups report progress on a daily or weekly schedule.

Additionally, there was a need to connect the dots between the individual, team, and leadership to answer key project questions the business need answered on the fly.

TECHNOLOGY GOALS

The vision was to design a flexible, centralized database platform with just enough structure that would allow play level/assessment data to be captured, both structured and unstructured, from multiple disciplines and stored in a single location as well as tie to projects worked in Geoscience Technology and the Reservoir Technology Center. The goal was to enable effective analytics, lookbacks, single source of truth that was not easy with current tools and processes. Additionally, the aim was to reduce redundant data entry across disciplines. The application needed to allow individuals and teams to speak intelligently to what had been done and what was currently being worked on, driving accountability back to the company. Alignment was critical with the corporate data leadership, to build a culture of leveraging data like any other asset, in order to drive efficiency and begin to eliminate activities that do not add value.

APPROACH: THEORY & METHODOLOGY

INNOVATING THE DATA MODEL

Pegasus innovated the way Chesapeake connected the data to their decisions and found new ways to structure and govern around the decision-making process. The differentiator is managing human data and interaction, not the traditional technical data management of scientific information or transactional back office approach. The data model for Pegasus is uniquely designed around the way people work and not the underlying technical data, by capturing critical context information about how something was done based on who, what, when, where, why, and how.

TREATING DATA LIKE AN ASSET

With the right information, there are significant gains to be made so it was imperative that the information gathered fed decisions for the business's bottom line. There was a drive to innovate the way the business gathered and analyzed information with the end goal being to drive a culture where decisions are led by the information and that value would be driven by being able to swiftly move from assessment to action.

ALIGNING & SERVING THE ORGANIZATIONAL NEEDS

Easy access to integrated information across the full Geotechnical Services group was a critical requirement for successful collaboration and roll-up to leadership. Information was previously shared between groups by passing spreadsheets with inconsistent identifiers which makes matching difficult and resulted in wasted time and significant errors. It was imperative that the system could simultaneously serve the immediate

needs of all ‘users’ at the various levels of the organization. Pegasus had to be successful in delivering data to leadership, teams and individual contributors.

APPROACH: THE TECHNOLOGY

PEGASUS REQUIREMENTS

The system design had to meet a broad set of organizational needs, processes and information for it to properly reflect the ‘Chesapeake way of working’. The system needed to be simple yet robust, centrally located and organized yet allow for cross reference of work products between departments and integration of workflows across multiple disciples over a period of time. The information needed to be collected within the context of the work done and decisions made, while allowing for easy access to data, documents and historical work.

PLATFORM TECHNOLOGY REQUIREMENTS

The technology needed to a) meet the requirements of the organization; b) be simple and intuitive for users to navigate; c) have the ability to change as fast as the business changed; d) be internally sustainable; and e) be a smart investment in terms of a cost/benefit analysis.

SOLUTION: PEGASUS

The resulting effort of the technological journey became known as Pegasus: a project, play and prospect inventory management application for Chesapeake that stores, manages and tracks the work being done between several groups under one umbrella: (Origin) Exploration and Business Units, (Matrix) Geoscience Technology and Business

Units, and (Vault) Reservoir Technology Center or lab. It was developed to be a common system that would help standardize and manage the subsurface evaluations and technical work products used by teams throughout the business. The system was designed to provide guidelines for technical work deliverables, set common milestones and guidelines for the delivery of technical products, set standards for the integrity of those products and most importantly emphasizing timely collaboration, documentation and knowledge transfer.

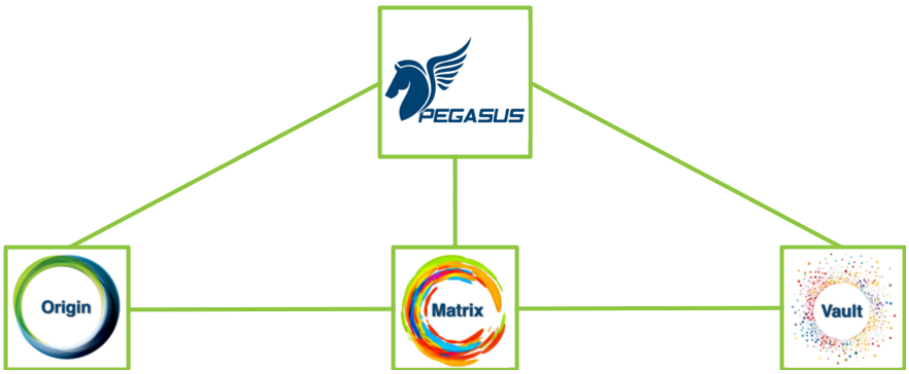

Figure 1. Organizational hierarchy of the Pegasus system.

ORIGIN: PROJECT, PLAY & PROSPECT INVENTORY MANAGEMENT APPLICATION

- Evergreen management of prospect, play, and project inventory
- Tracking and storing of key interpretation project and data requests
- Detailed risk and resource estimates integrated with analytics
- Peer risk and management review approvals and recommendations
- Integrated risk and resource tracking to support the decisions being made between exploration to appraisal

- Visibility, quantification and prioritization of opportunities that have been amassed by the organization

MATRIX: PROJECT MANAGEMENT & INVENTORY TOOL FOR SUBSURFACE TECHNOLOGY PROJECTS

- Team meetings and milestones captured
- Deliverables and decisions documented
- Decision impacts on business tracked
- Feedback loop: closes communication gap with stakeholders
- Priorities visible. Aligns with goals of all stakeholders

VAULT: PROJECT MANAGEMENT & INVENTORY TOOL FOR LAB JOBS

- Capacity management
- Tracking internal the lab work in relation to key exploration and development projects
- Work is characterized by Partner, Job Type and Test Type
- Quick and easy overview of lab activities
- Process tracked: Set-up, Testing in Progress, Data Distributed

BENEFITS & RESULTS

WINNING ALIGNMENT

All technical, subsurface, project and interpreted data is now captured and correctly organized in the Pegasus system so that the data is now easily available for end users at every level of the organization. Pegasus eliminated the need for complex manual systems to compile, organize and visualize disparate pieces of information which were

often more prone to frequent errors and time commitments. Effective organization of this information has allowed for continuous improvement and streamlining of workflows to remove bottlenecks, eliminate redundancy and rework and allow more attention to be focused on the technical work at hand.

Pegasus delivers the Chesapeake leadership with the most current and correct information made available from the technical teams in the shortest time possible supporting their needs with data driven decision making abilities.

Pegasus allows for renewed connection between teams, disciplines and departments. The workflow procedures have resulted in much better integration between the projects and departments that had been previously operating in isolated information silos. In the past, information from projects and teams were ultimately lost when team members reorganized, or new leadership took over.

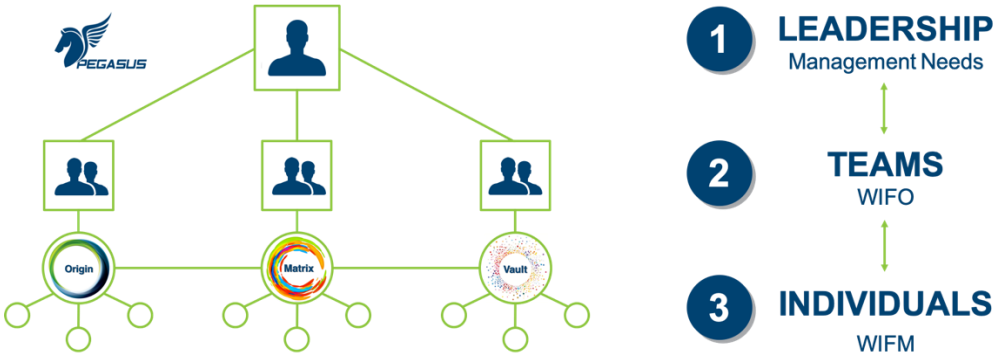

Figure 2. Connecting the vertical and horizontal needs of the organization

Productivity & Proactivity Results for Business

Proactively managing the business rather than reactively managing, this technology helps set Chesapeake up for success and improves the probability of meeting the business goals. The result is a greater confidence in delivery, including improvements in the following areas:

- Number of prospects in inventory, rate of growth
- Shortening duration of project cycle time
- Time saved; errors avoided in managing manual processes
- Improving capacity management in the lab
- Better financial stewards, allocating resources to value added activities, working on the highest priority projects

Internal Sustainability

Sustainability of the technology internally was critical to the long-term success of Pegasus. There are now approximately ten (10) internal administrators who adjust and modify the application when it's needed by the business. Internal sustainability of the technology allows a sense of ownership. Additionally, Pegasus is set up in such a way that its function and capabilities is not hindered or disrupted by a change in other scientific interpretation tools, as it is for the repository of the knowledge.

Critical Success Factors

The following elements were a critical part of the Pegasus journey at Chesapeake:

- Leadership commitment and buy in from the start

- Technology around a shared culture
- Adaptable technology, designed top down and bottom up
- Building on success and momentum

SUMMARY

Leveraging technology to implement a new approach helps set the organization up for success and improves the probability of meeting its business goals. Pegasus is about setting expectations, managing knowledge and building a corporate memory for the technical basis for which the business decisions are made. Chesapeake has significantly advanced their strategic goal of achieving consistent, technical excellence across the organization.

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