HighMount Uses Automated Data Quality Management to Improve Data Integrity and Accessibility

Case study: InnerLogix software combined with the new DQM process delivers high-quality, value-added E&P data to users across the enterprise

Challenge
Resolve data inconsistency, redundancy, and inaccuracy to enhance productivity and ensure user confidence; empower business units to manage their own data—both the quality and the timing of its availability.

Solution
Implement the InnerLogix* software suite with customized rules; synchronize data between the corporate database—Petroleum Information Data Model (PIDM)—and working project data (in Petra® and OpenWorks®); monitor and measure continuous data quality improvement.

Results
Standardized data management enterprise-wide; improved data reliability and availability, achieving 99+ percent quality; reduced data loading issues, invalid well data, and missing or inconsistent data between projects; captured value-added information for retention as a corporate asset.

Analyze and improve quality of data
HighMount Exploration & Production LLC wanted to increase the productivity of its geoscience and engineering community through improved data integrity, accessibility, and synchronization between corporate, regional, and project repositories.
In particular, there was a need to improve project data quality in the Petra system, a geologic interpretation program used by HighMount to generate prospects and determine drilling locations.
Several existing issues had to be addressed. Inconsistencies between data sources were causing user frustration due to a lack of trust in the data. There were also multiple points of data entry, and data was being loaded using nonuniform methods on different time schedules. An overriding concern was inconsistent presentation of the same information by various groups within the organization.
The company strategy was to create a standardized data quality management (DQM) process and implement software technology tools with the required functionality, of which data quality analysis was a critical component. The end goal was to have value-added data that would not only be more reliable, but would be easily accessible to users through a centralized, trusted corporate database, PIDM.

IT and business unit discuss the results of a quality control (QC) run.
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Create DQM process and standards

A collaborative solution

HighMount views the DQM process as a partnership between IT, the business unit, and management. Therefore, a solution to the general frustration with inconsistent and inaccurate data would have to be collaborative, involving all stakeholders. After evaluating other applications, HighMount selected InnerLogix software for its automated, rule-based system, which

- analyzes the quality of the data based on specifically defined measurements
- corrects the data based on customer-specified workflows
- creates quality exception reports.

This software suite is capable of handling HighMount’s requirements for five identified data types: well headers, directional surveys, perforations, marker picks, and production data. It also accommodates multiple sets of DQM rules that apply to either the corporate or business unit level. The purpose of corporate-level rules is to maintain quality standards across corporate and regional datastores, while the business unit level rules define area-specific quality standards.
To create these rules, IT met with the business units (focusing on highest-priority data areas first) to gather requirements and determine their friction points, i.e., data issues that stop the users from interpreting. The friction points were turned into DQM rules to help resolve data issues using the following categories:

- completeness
- consistency
- uniqueness
- validity
- content
- audit
- data changed.

**Collaborative rule-setting process**
While the DQM process basically became transparent to users through automation, certain functions still required human intervention. First, the business units had to participate with IT as the basic DQM rules were defined, ensuring that quality data was identified and delivered to the asset team’s regional master projects. Secondly, the business units determined their own quality standards (acceptable levels) and correction rules; they assumed responsibility for timing of QC jobs, reviewing quality exception reports, and correcting the data as needed.

**Data flow and quality measures**
The data flow process begins with the company’s PIDM database, which holds all of the US well data and production data for approximately 3.7 million wells. This repository can store multiple well header iterations for the same well, allowing both retention of the industry version and the ability to capture and retain HighMount’s revised version of the well header. The valued-added data is then flagged as “preferred” and is promoted to the top without loss of or modification to any preexisting data.

The data is next assessed against the quality standards defined in the InnerLogix RulesEditor. Data items that fail assessment may be automatically corrected based on corporate or business unit defined rules. If the data does not meet the specified level of quality and cannot be autocorrected, it is passed to an exception process, in which issues are manually evaluated and resolved using InnerLogix technology.

As users revise project data in Petra, the InnerLogix system detects the changes and applies criteria to determine which changes should return to the regional- or corporate-level database. User data is promoted to master and regional projects, provided it meets the standards defined by the business unit as value-added information to be retained or promoted.

**Increased user productivity and trust in data**
The newly automated process has increased user productivity by reducing the manual effort and the risk of data errors. HighMount users now have access to the latest data and consistent information, which has built trust in its validity. The DQM process has significantly cut the amount of time that employees have to spend on investigating, validating, and correcting data issues, allowing them to concentrate on their primary tasks of finding and managing reserves.

“This is not an IT initiative imposed on the business, but a real partnership between IT, the business unit, and management. It is a collaborative solution in direct response to the frustration caused by inconsistent and inaccurate data.”

Tina B. Warner
Business Systems Specialist
DQM Architect
HighMount Exploration & Production LLC
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By implementing this repeatable process, HighMount is continuously improving the quality of its data. The new way of working in conjunction with new software technology enabled in-depth data analysis and showed major quality improvements in just 8 months, reaching a level of 99+ percent quality. Much of the project’s success can be attributed to the DQM process, which utilizes extensive early planning and communication before deploying the solution—first understanding the big picture and then stepping into the details.

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“The DQM process allows us to go beyond just moving the data. It involves true data quality analysis and continuous quality improvement. The applications we used in the past did not have the intelligence and rules behind them, like InnerLogix, to protect data from being overwritten or lost.”

Tina B. Warner
Business Systems Specialist
DQM Architect
HighMount Exploration & Production LLC

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