Schlumberger

InnerLogix Data Quality Management Solution

Achieve reliable data in your information environment

APPLICATIONS

- Analysis and QC of well data, projects, logs, and seismic data

FEATURES

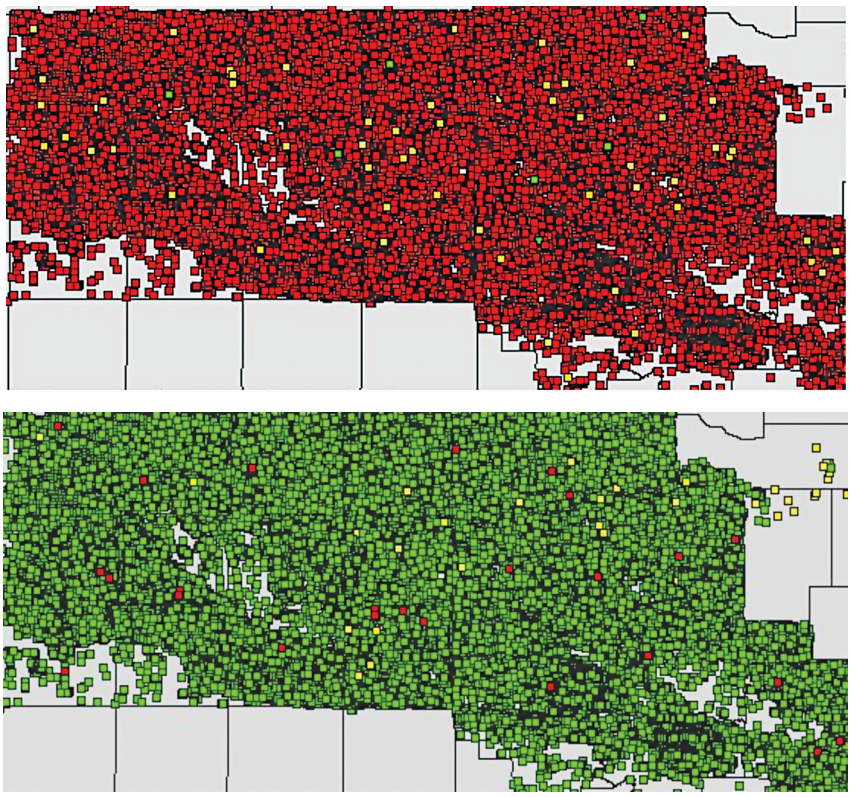
- Automated, repeatable data-quality-management process provides increased confidence in data
- Simultaneous measurement, synchronization, or correction of large data volumes across multiple datastores
- User-defined business rules to detect changes and measure quality, and to correct or synchronize data
- Comprehensive reporting of assessments and corrections with detailed job audit logs
- Data improvement monitored over time
- New or changed data identified in near real time
- Esri SDE layers are updated with data-quality information

If existing data cannot be trusted as a foundation for ongoing planning and operational decisions, geoscientists and engineers will frequently choose to reacquire and reload data. There are a number of reasons for this lack of trust—from the physical impossibility of manually performing required quality checks to insufficient control of the data. Whatever the cause, it can destroy the productivity gains an organization has worked hard to implement.

Data quality management (DQM) is a process for achieving reliable data in your information environment. To maintain confidence in data quality, this process must be continuous, not just a one-time event. To achieve this, Schlumberger provides a unique combination of InnerLogix* technology and DQM methodology to automatically and continuously check and improve data quality. As confidence in data quality is raised, O&G professionals are able to focus more of their time on their core job functions rather than data-related tasks.

DQM methodology reduces nonproductive time

The Schlumberger DQM methodology is based on Six Sigma practices originally designed to improve manufacturing processes by eliminating defects. These practices have been widely extended into other types of business processes. In data quality management, Six Sigma methods are implemented with the goal of reducing the amount of nonproductive time for geoscientists and engineers. The Schlumberger DQM solution was developed specifically for the E&P industry to address both processes and data. The systematic approach assesses, improves, and controls data to generate metrics-based confidence in the data being used.



Top: Results from initial quality assessment.
Bottom: Quality assessment results after continuous application of assessment and correction rules.

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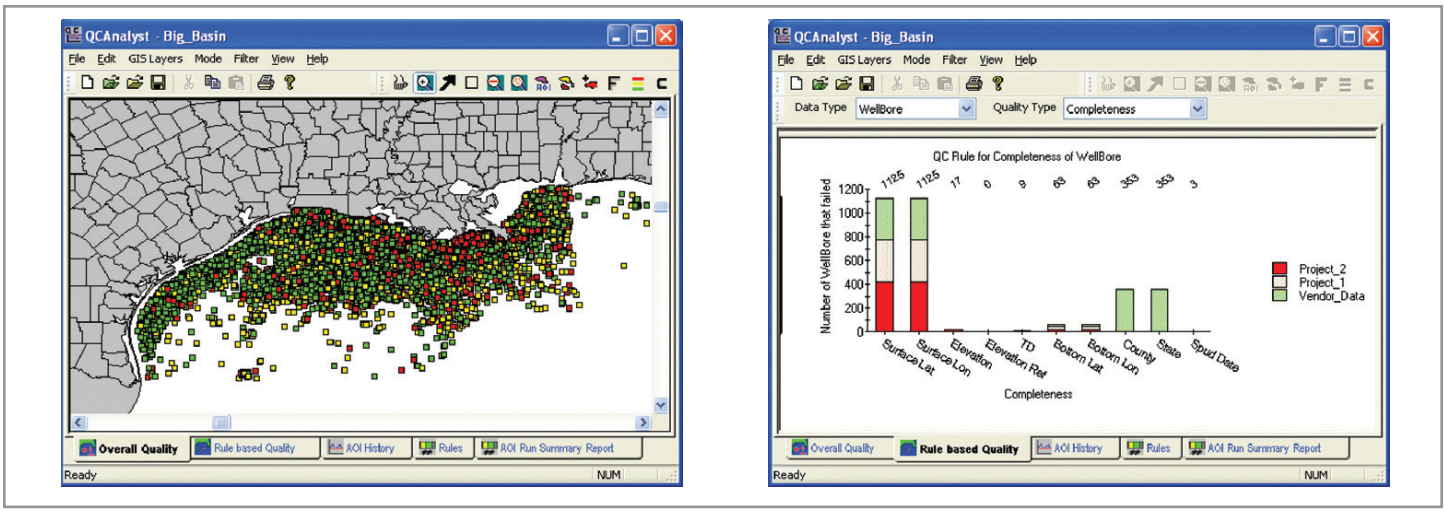

GIS and chart displays showcase data quality.

No two companies are alike; a custom model must be designed for each unique environment. Expert Schlumberger consultants design scalable DQM workflow models to address quality defects—from the obvious to the obscure—working with you to identify problem areas that are impeding the ability to make business decisions with trusted data. Aided by built-in rules and customization capabilities, a set of business rules are quickly established to address identified quality problems. These rules become the basis for a continuous process to check and repair data quality. Over time, the initial rule set can be expanded to include more parameters and more data types. Once the rules are in place and actionable metrics are streaming in, an iterative process of assessments and corrections begins, leading to consistent, measurable data quality. As this is an ongoing process rather than a one-time event, errors introduced either by new data or drift in existing data are immediately identified and corrected. Trust in your data subsequently increases, resulting in faster decision making and less nonproductive time.

Incorporating a strong DQM process ensures that the company receives the maximum return on their data investment and builds confidence in the quality of that data by

- preventing contamination from external sources
- establishing a continuous data-quality improvement process
- maintaining consistency between data stores
- measuring and reporting data-quality metrics
- defining business rules for data-quality improvement
- standardizing data-migration processes
- removing duplicate data
- performing a data health check for newly acquired assets.

Advanced technology ensures integrity

The Schlumberger DQM solution uses InnerLogix technology specifically designed to meet the needs of the E&P industry. This technology provides the ability to assess, analyze, correct, and synchronize data, ensuring integrity throughout its lifecycle.

InnerLogix is an automated, rule-based application that corrects and synchronizes data across multiple datastores. Data changes and issues identified by the InnerLogix application are automatically corrected or synchronized through a continuous process that checks data against user-defined business rules, thus ensuring that defects are systematically eliminated and that validated data are propagated throughout the data environment.

Data checks include the following:

- Validity: Does the data make sense, and does it honor science and your standards?
- Completeness: Do you have all your required data?
- Uniqueness: Do you have duplicate items in your datastore?
- Consistency: Do the attributes of each item agree between data sources?
- Coverage: Is the data relevant to the identified selection criteria?
- Audit: Has the item (e.g., well header) been modified, added, or deleted?

Given today's data volumes, manual intervention is impractical—a repeatable, continuous process driven by automation is required.

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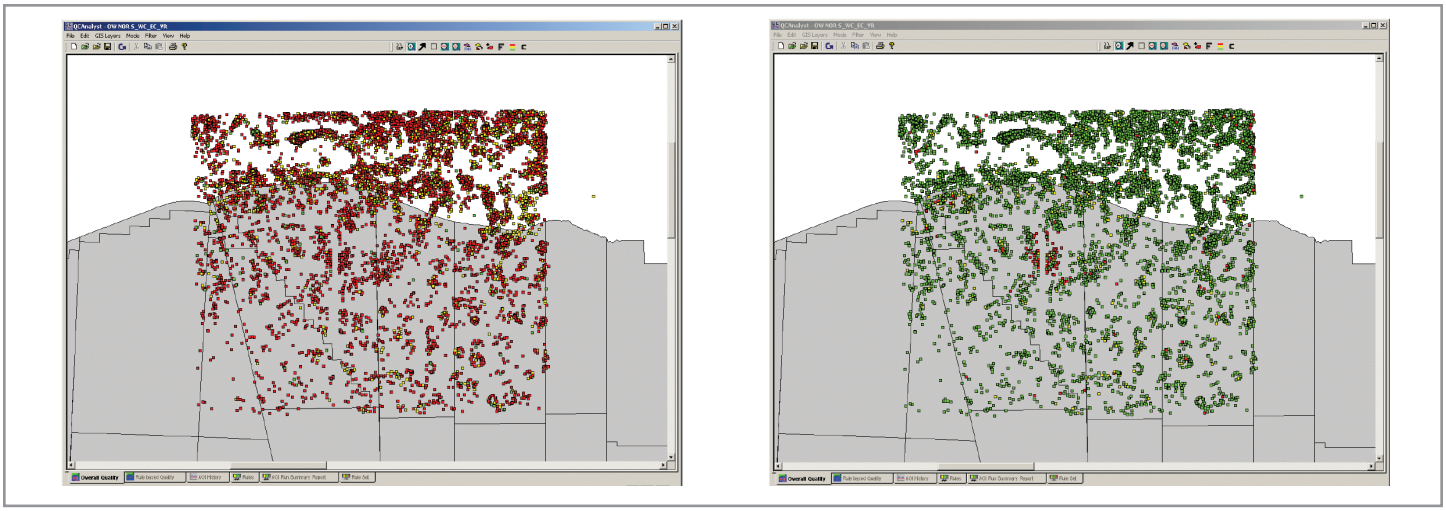
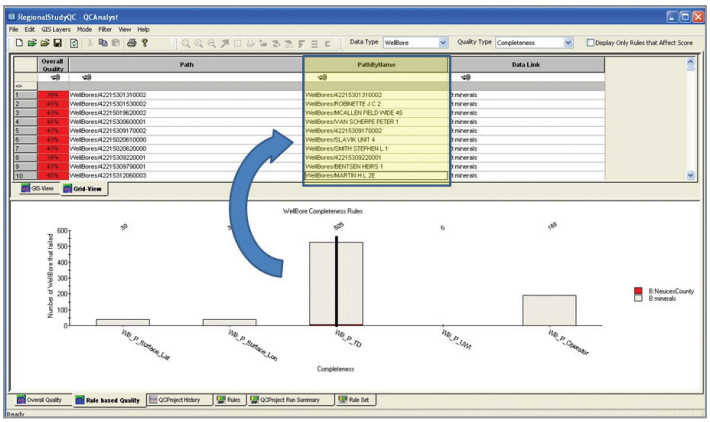


Left: Map showing that initial overall project data quality was less than 75% accurate before rule-based analysis and cleanup were performed.
Right: Map showing significantly improved overall data quality (greater than 90% accurate) after issues were corrected.



Graph showing number of failures (issues) of customer-defined wellbore data completeness rules identified during automated assessment runs.

InnerLogix also offers a specialized set of more complex rules through a license feature. These rules require significant domain knowledge and include features such as the wellbore digital elevation checker, deviation survey outlier method, and log curve stratigraphic range verification.

Enhanced support for seismic navigation datatypes and subsurface interpretation data is also provided. These navigation datatypes allow sophisticated comparison workflows across datasources, allowing you to answer questions regarding duplicate 3D seismic surveys and 2D navigation lines as well as look for missing horizon or fault information. All generic quality rules available in the wellbore model can be brought to bear on seismic objects; in addition, quality rules specific to the seismic domain have been introduced, focusing on common problems with 3D survey geometry and 2D shotlines.

The application interface has a variety of views for analyzing the results of assessment or correction runs. Users have the option of viewing their results in graphs, GIS maps, tables, and reports to develop an understanding of underlying data quality issues that have been identified by InnerLogix software. A quality measurement is established for each analyzed data type and discrepancies between data sources are flagged. The monitoring functionality identifies new or changed data on a minute-by-minute basis.

As new or changed items are detected, the user can

- assess quality of the new or changed data items
- perform automated rule-based data loading to one or more datastores, eliminating the need to manually load data into project or corporate datastores
- write the updated information to a spatial data engine (SDE) layer
- update the information stored as metadata

Other functionalities include

- insertion and updating of an existing Esri SDE layer with information generated during assessment or correction jobs
- discovery, exploration, synchronization, and repair of data
- comparison of data across multiple datastores
- investigation of failed items from assessment runs
- advanced QC analysis on log curves and marker picks
- identification of duplicate wellbores, log curves, marker picks, and 2D navigation data, and 3D surveys.

InnerLogix Data Quality Management Solution

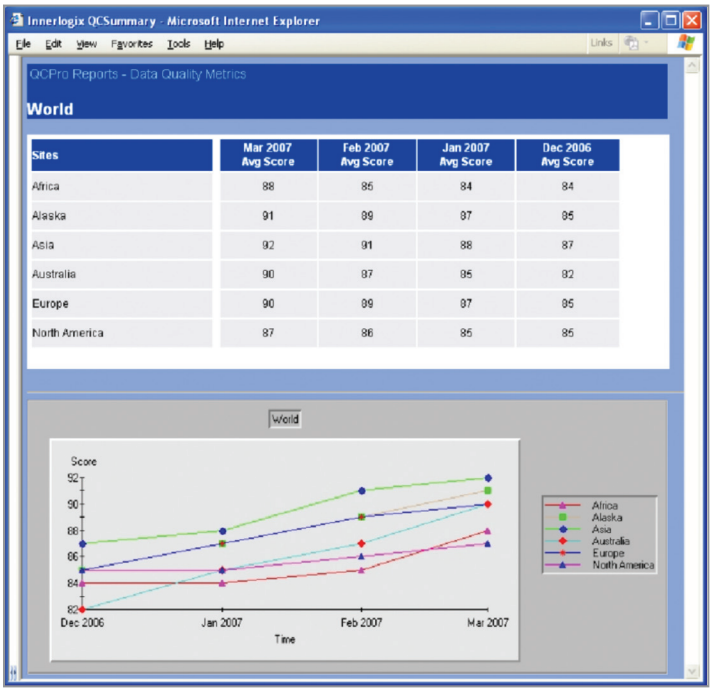
InnerLogix adapters

InnerLogix technology provides more than 50 plug-and-play adapters to common and proprietary datastores for reading, inserting, and updating both PC and UNIX application data. The InnerLogix application maintains a single set of adapters used by all Schlumberger applications. These adapters use open-format, XML-based definitions for each data source, allowing a high degree of customization.

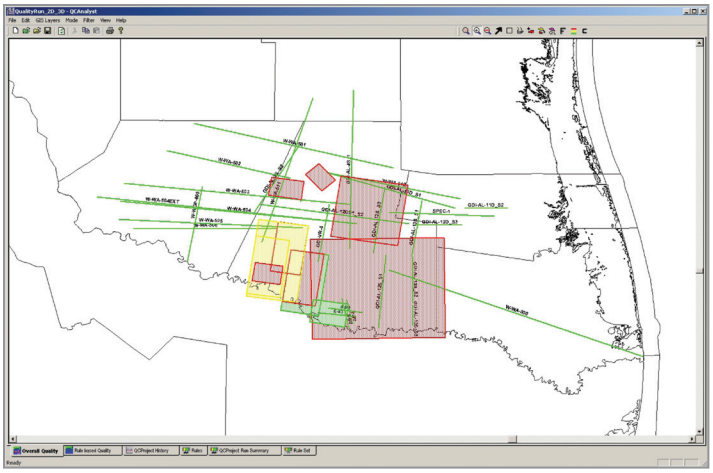
Adaptors are available for most common geology and geophysics applications and data repositories, including the Petrel* E&P software platform, the Studio* Knowledge database, GeoFrame* reservoir characterization software, the ProSource* E&P corporate information management system, and the Seabed* advanced E&P datastore system. Adaptors for LAS files and a wide range of other industry applications are also available.

If required, Schlumberger can develop a custom adapter for your proprietary datastore.

E-mail sisinfo@slb.com or contact your local Schlumberger representative to learn more.



Results of multiple area-of-interest-based data quality reports run over time.



Color-coded graphical view of seismic data quality.

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