

Transformation of the Seismic Interpretation Process into a Knowledge Based Asset Management System

Muhammad H. Badar¹, Mohammad Wasi¹

¹Exploration Application Services Department, Saudi Aramco, Dhahran, SAUDI ARABIA

ABSTRACT

This paper discusses the application of knowledge management methodologies to transform existing seismic interpretation workflows into a knowledge-based asset management system. Seismic interpretation has become an iterative, interactive and resource intensive process which generates vast amounts of map and volume- based attribute data, resulting in significantly increased storage utilization and data complexity. This gives rise to new project management concerns for the seismic interpretation environment. Our major challenges are: to identify and extract the 'best available interpretation version', to streamline the data flow, and to leverage existing corporate knowledge.

Conventional project-based models no longer provide a sustainable solution to support basin-to-reservoir scale seismic interpretation workflows. A new object-based model provides a more viable alternative by distributing the master seismic traces, seismic attributes and associated interpretation data at the infrastructure level. The major advantage of a distributed data model is to significantly reduce data duplication by providing a mechanism to share the original seismic and attribute volumes with multiple interpreters instead of bundling copies into interpreter-specific projects. Distribution also provides an opportunity to optimize resources based on the data type: e.g. rapidly changing interpretation data can be stored on a file system designated for daily backups or mirroring while the more static master seismic data might be stored on a file system that is not backed up regularly.

Another challenge is to capture knowledge during seismic interpretation. Mapping the data flow for all seismic interpretation processes provides an opportunity to introduce new standards for capturing interpretation outputs. Knowledge management workflows are incorporated into the seismic interpretation processes, enabling interpreters to capture knowledge during seismic interpretation.

The presented solution supports an interactive, iterative seismic interpretation process with optimized resource usage and knowledge management.