A successful case study of collaborative and productive environment empowered by SIS Technologies

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AGENDA

• DIAVAZ DEP P&G in the context of Mexico energy sector.
• Objective and Outcome
• Multi-user collaboration data base.
• Customized workflow guide solution.
• Implementation strategies.
• Integrated workflow
• Studio Pilot Project
• Centralized Infrastructure
• Results
• Benefits of a collaborative and productive environment related with Mexico Energy Reform
• Summary
DIAVAZ DEP P&G

A 100% Mexican company in the energy sector in México.

Strategic alliances with leading international and domestic firms.

Commitment with the Mexican energy sector for over 40 years providing quality services in for segments:

- Services
- Exploration and Production
- Natural Gas
- Midstream

DIAVAZ DEP P&G has over 13 years of experience developing upstream and midstream operations in oil and gas fields, oriented towards value creation though oil fields development and providing professional and high quality performance, strictly observing safety and environmental protection.
DiaVaZ DEP P&G Presence in Mexico

From Mexico onshore Diavaz Brownfield represents:
5.3% of total Reserves and
5.8% of oil production at 2016
Diavaz has participated in all the E&P contract model in Mexico since 2003. It has allowed us to identified the potential of Mexican onshore brownfields.
DiaVaZDEP P&G Brownfields Characteristics (Mexico onshore)

01 Cuervito
- Tight gas-condensate sandstones
- Main reservoir: Eocene Yegua, Cook Mountain and Queen City
- Geological Setting: Growth Faulted System
- Area: 210 km²
- Porosities: 9 - 12%
- K: 0.01 MD
- Well architecture: multitarget tubingless with hydraulic fracture

02 Fronterizo
- Tight gas-condensate sandstones
- Main reservoir: Eocene Yegua and Queen City
- Geological Setting: Growth Faulted System
- Area: 210 km²
- Porosities: 10 - 15%
- K: 0.01 MD
- Q_gas avg well = 2.5 MMstdc
- Gp well = 0.5 – 3.0 Bcf
- Well architecture: multitarget tubingless with hydraulic fracture

03 Ebano
- Naturally fracture limestone with extra-heavy oil. Main reservoir: Cretaceous San Felipe (Ksf) and Agua Nueva (Kan)
- Geological Setting: Tectonic Inversion
- Area: 1504 km²
- Porosities: 12%
- K: 0.01 MD
- Q_gas avg well = 180 bpd
- Gp well = 0.2 – 0.6 MMb
- Well architecture: horizontal open hole well, perpendicular to fracture network

04 Miquetla
- Multi target geological setting carbonate breccias reservoir + tight oil reservoir sandstones + shale oil resources
- Geological Setting: Multiple
- Area: 112 km²
- Tamabra K: 0.1 -100 mD.
- E Chicontepec K: 0.1 – 1 mD.
- Porosities: 9-14 %.
- Q_oil avg well = 400 bpd
- Np well = 0.3 – 0.6 MMb
- Well architecture: multitarget directional well with stimulation
DIAVAZ DEP P&G Brownfields Characteristics (Mexico onshore)

**Barcodon**
Naturally fracture pelagic carbonate reservoir with tight & bio-clastic supported facies (dissolution)

**Catedral**
Naturally fracture carbonate reservoir with tight & bio-clastic supported facies (dissolution – dolomitization)

- All fields are challenge in terms of reservoir characteristics and complexity, most of them require knowledge in carbonate reservoir with different process of store and flow and tight sandstones.

- Redevelopment of the described areas are conditioned to a detailed revision of reservoir models helping a new oil in place assessment of every reservoir and the search of sweet spots areas for future development.

- Each described field has specific problems to solve and particular solutions but it is possible to wrap-up a genetic Diavaz workflow.
Naturally fracture Tight carbonates.
- Debris flow breccias carbonates.
- Tight gas sands.
- Tight oil sands.

- Multi stage development fields.
- Mix of old & modern well logs.
- Data QC.
- 2D seismic & 3D seismic.

- Corporate centralized technical service.
- Asset teams close to the field.
- Limit manpower.

- Low cost of IT infrastructure.
- Growth flexibility according to needs

Geoscience Data Management Challenges

- Asset teams close to the field
- Limit manpower
- Corporate centralized technical service
- Mix of old & modern well logs
- Data QC
- 2D seismic & 3D seismic
- Low cost of IT infrastructure
- Growth flexibility according to needs

- Assets with reservoir diversity
- Mature fields & number of wells
- Resource & staff optimization
- Optimizations of hardware & software resources

Challenges
Objectives & Outcomes

• Create a centralized G&G database ensuring the security of information.

• Collaborative environment that allow access to the centralized technical team and asset teams to the same database, controlling user preferences and reporting changes in data and models.

• Standardized G&G nomenclature for all assets and documented relevant workflows and methodologies.

What's the cost efficient solution that fits the needs of mid size E&P company
Multi-user collaboration data base - Studio

- SQL Server data base supported.
- Six (6) master repository.
- Eight (8) initial users.
- Standardized G&G nomenclature for all assets and documented relevant workflows and methodologies.

DIAVAZ DEP P&G PROJECTS

- Consists of:
  - 1975 Wells (7800 Original)
  - 5200 Logs (17800 Original)
  - 7674 Markers (11200 Original)
  - 420 Surfaces (1027 Original)
  - Additional cultural data (maps, shapefiles, and others)
Customized workflows guide - Guru

- Support, guidance and training
- Context associated
  Over 400 video guides and 1000 pages
  Workflows, quality checks, practical exercises, quick guide and training
  Geophysics, Geology, RE, Drilling and Shale workflows
- Own Content Generation
- Petrel Guided workflows automation
Strategy

Projects.
Data.
Users.
Software and applications.
Configuration & infrastructure assessment.
Backup.
Design of the solution.

Planning

Implementation

Optimization

New Assets

- Studio configuration.
- Roles & profiles.
- Templates & Standards.
- Updates.
- Quality Control.
- Upload.
- Validation.

- Studio & Guru Training programs.
- Documentation & Delivery.
- Studio configuration.
- Roles & profiles.
- Templates & Standards.
- Quality Control.
- Upload.
- Validation.
Integrated Workflow

Preserve data integrity across domain platforms with a technical common language

Adapt to technologies through Guidance and training

Enable large scale data transfer

Corporate Data Manager enables the collaboration, share knowledge and promote productivity

Immediate notifications and alerts to users
Studio Pilot Project

Integration through a robust Data Base:

- True Collaboration among asset teams.
- Structure construction and nomenclature of Studio Data Model
- Enables Administration Workflows.
- Centralized Infrastructure.
- Optimización de volumen información en 45%.
Centralized Infrastructure

Asset Management Scenario

Integrated Study Scenario

- Reservoir Engineer
- Geomodeler
- Geologist
- Geophysicist
- Data Manager
Guru Pilot Project

Guru Deployment

25 Customized Guru Workflows:

- Geological Model of the study areas
- Data Management Procedures
- Geophysical & Drilling best practices
Results

- **Strengthen planning decision-making process** with a Collaborative Environment.

- Collaborative environment that favor close and coordinate interaction from the corporate technical team & asset teams. (Systems of alerts and notifications)

- Standardized workflows and data base enable to quickly rotate people from one asset to another.

- User preferences protocols in conjunction with corporate Information security policies.

- Server & network performance optimization by avoiding duplicate data. After the studio implementation the data base is 45% of the original.

- Customized best practices through GURU implementation, accelerating trainee learning process and new asset users in more than 40%, G&G performance and reducing training cost.
Mexico has opened up its oil industry, offering Exploration and Extraction areas through license and production sharing contracts. Since 2014 the Energy Reform trigger an aggressive bidding program of onshore, offshore, deepwater areas and PEMEX farm outs areas.

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An aggressive bid round program since 2015 have represented an increase of 150% in the volume of data and information created.

Studio has helped DIAVAZ DEP P&G to properly manage data pack and technical assessments. This tool allows to securely save information related to more than 1500 wells and over 8000 Km2 of 3D seismic.
Summary

- Studio multi-user collaboration data base has represented a cost effective solution optimizing staff, hardware and software resources.

- Standardize data base and workflows in conjunction with documentation in Guru allowed to optimize user productivity in more than 23%, server and network performance optimization of 45% and training cost reduction in 30%.

- Studio Multi-user collaboration data base is a flexible solution that enables a progressive growth incorporating new assets information without important investments.

- The results and experiences of this case study give an important reference for any mid size independent E&P company related to cost effective solution of collaborative and productive data management environment.