

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

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What's Next?

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Le Palais des Congrès de Paris

Schlumberger

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 through oil fields development and providing professional and high quality performance, strictly observing safety and environmental protection.

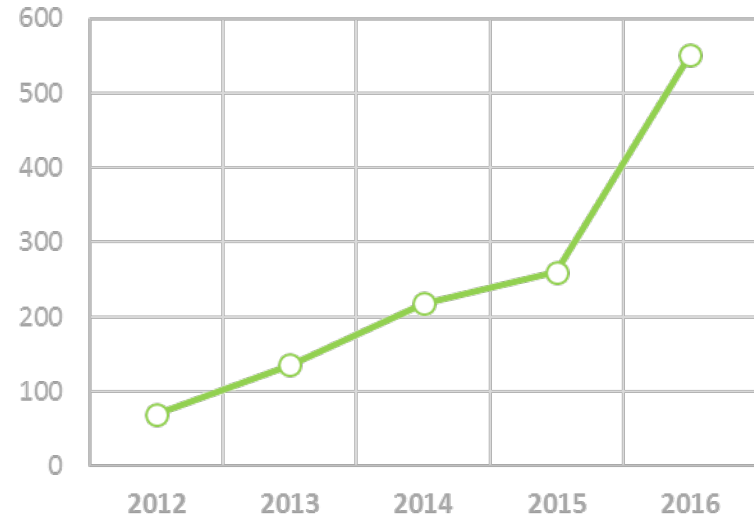


DIAVAZ DEP P&G Presence in Mexico

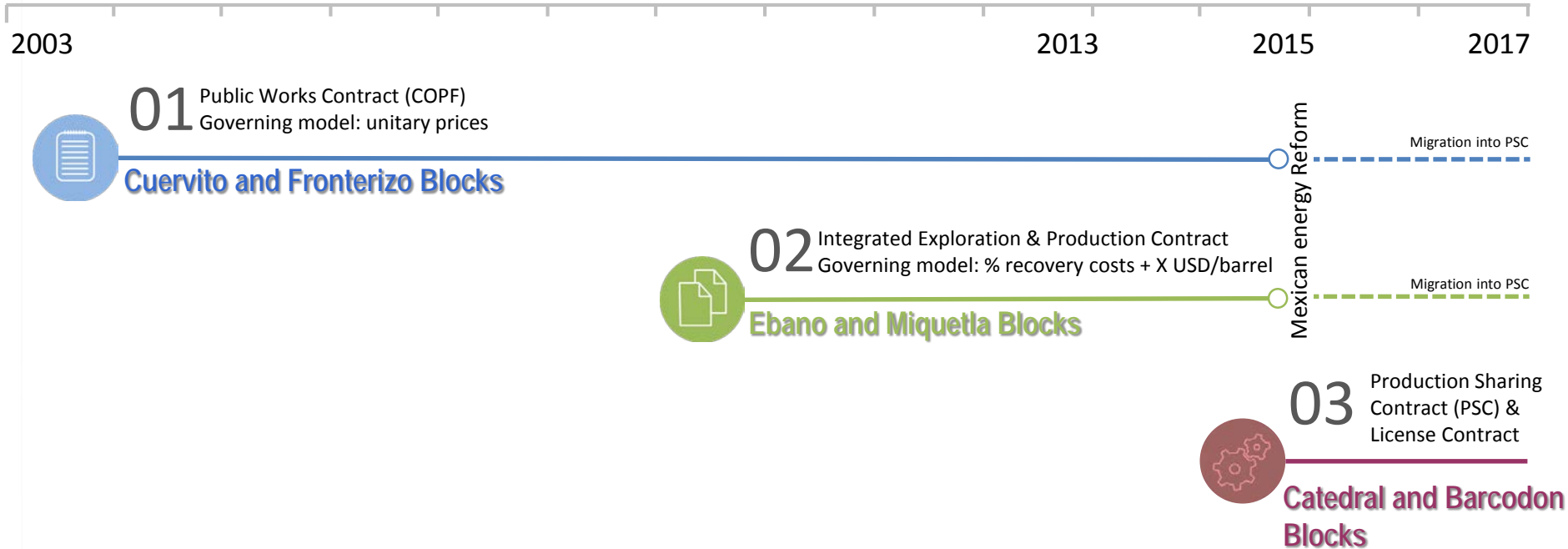


From Mexico onshore Diavaz Brownfield represents:
5.3 % of total Reserves and
5.8 % of oil production at 2016

Diavaz Brownfield Reserves Evolution (MMBoe)



Mexico Exploration & Production Contract Evolution



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

DIAVAZ DEP P&G Brownfields Characteristics (Mexico onshore)



01

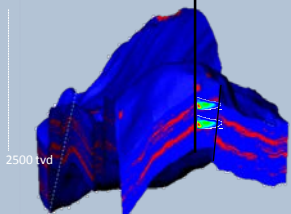
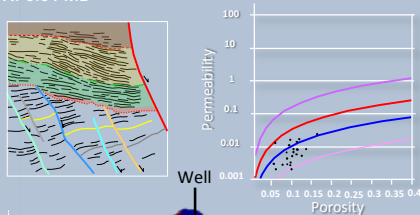
Cuervito

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

$Q_{\text{gas avg well}} = 2.5 \text{ MMpcpd}$
 $Gp_{\text{well}} = 0.5 - 3.0 \text{ Bcf}$



Well architecture: multitarget tubingless with hydraulic fracture

02

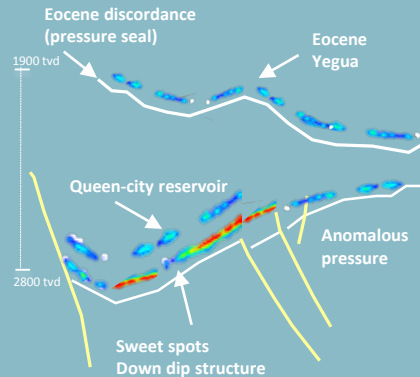
Fronterizo

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

$Q_{\text{gas avg well}} = 2.2 \text{ bpd}$
 $Gp_{\text{well}} = 0.6 - 2.1 \text{ Bcf}$



Well architecture: multitarget tubingless with hydraulic fracture

03

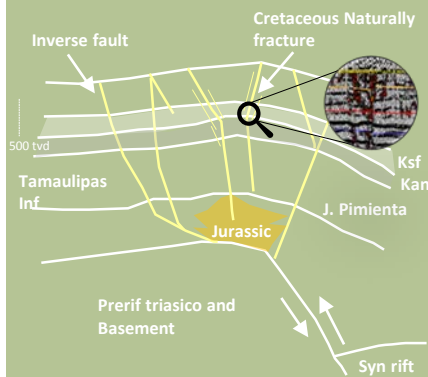
Ebano

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

$Q_{\text{oil avg well}} = 180 \text{ bpd}$
 $Np_{\text{well}} = 0.2 - 0.6 \text{ MMb}$



Well architecture: horizontal open hole well, perpendicular to fracture network

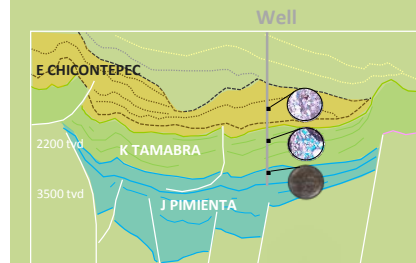
04

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 %
 $Q_{\text{oil avg well}} = 400 \text{ bpd}$
 $Np_{\text{well}} = 0.3 - 0.6 \text{ MMb}$



Well architecture: multitarget directional well with stimulation

DIAVAZ DEP P&G Brownfields Characteristics (Mexico onshore)

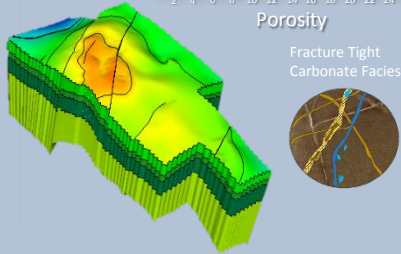
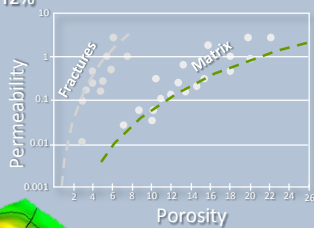


05

Barcodon

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

Geological Setting: Tectonic Inversion, structural faulted dome
Area: 11 km²
Porosities: 12%
K: 0.01 MD

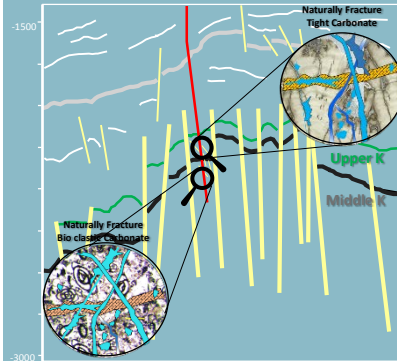


06

Catedral

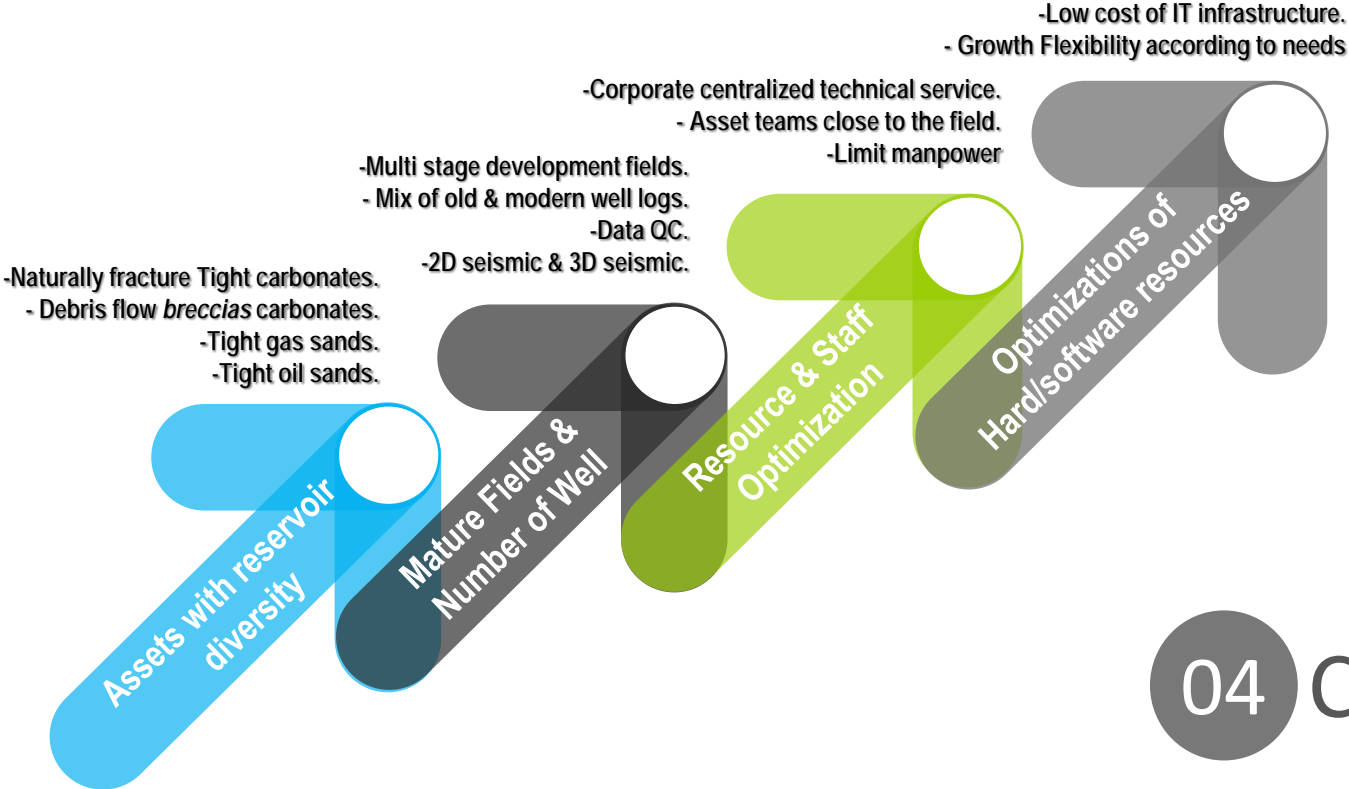
Naturally fracture carbonate reservoir with tight & bio-clastic supported facies (dissolution -dolomitization)

Geological Setting: Tectonic Inversion, structural faulted dome
Area: 58 km²



- 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

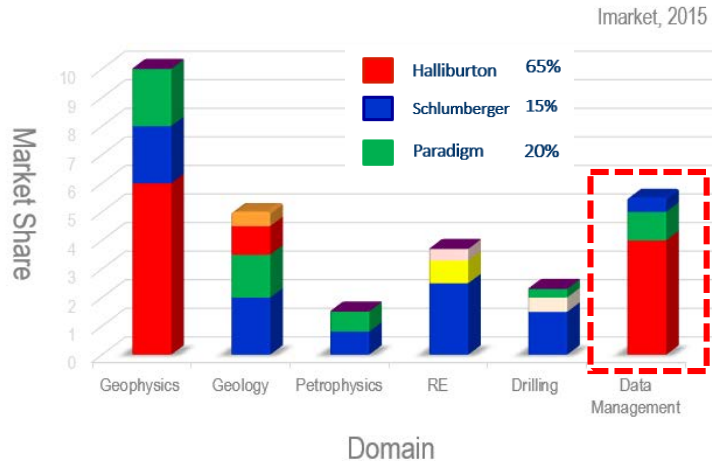
Geoscience Data Management Challenges



Objectives & Outcomes



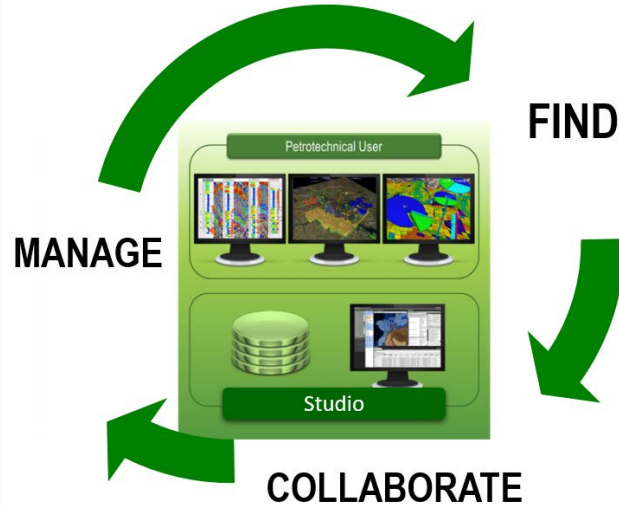
- Create a centralized G&G database ensuring the security of information.
- Collaborative environment that allow access to the centralized technical team and asset teams to the same data base, controlling user preferences and reporting changes in data and models.
- Standardized G&G nomenclature for all assets and documented relevant workflows and methodologies.



What's the cost efficient solution that fits the needs of mid size E&P company



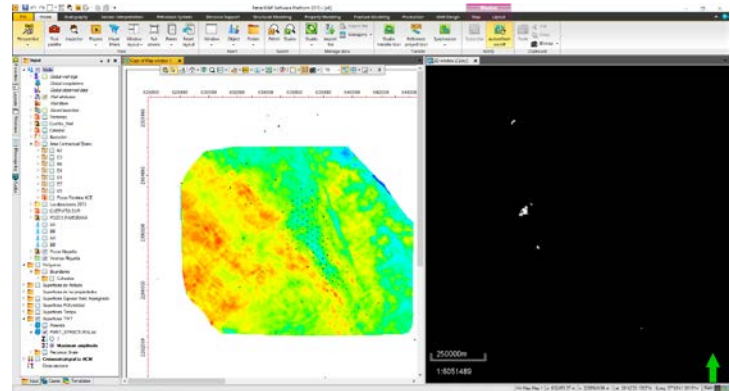
Multi-user collaboration data base - Studio



DIAAZ 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)

- 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.



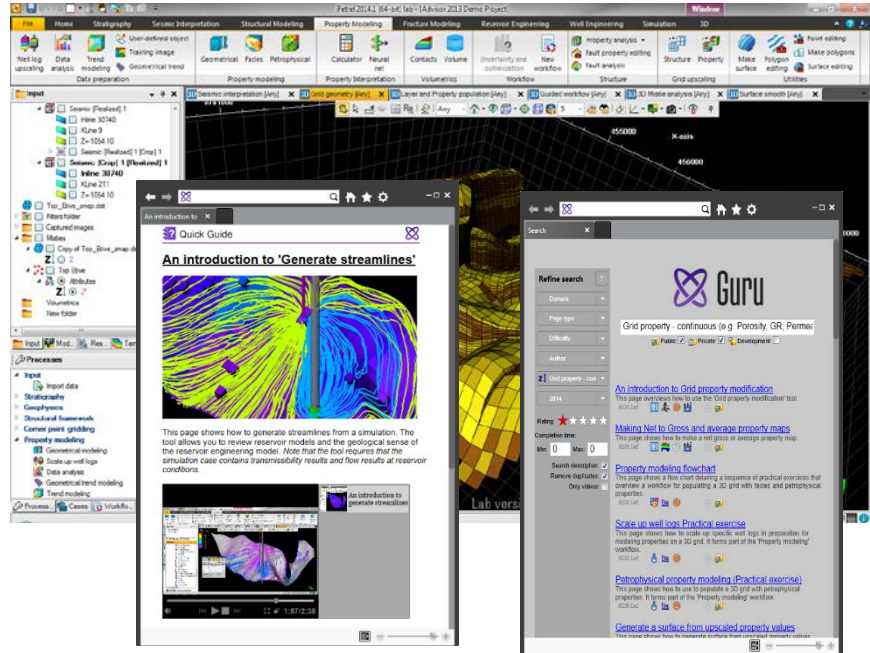
Customized workflows guide - Guru

Adoption rate improvement
and reduce learning curve

Carry out more
complex processes

Capture Knowledge
standardizing
working practices

- 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



PLANNING

IMPLEMENTATION

OPTIMIZATION

NEW ASSETS

- Projects.
- Data.
- Users
- Software and Studio configuration.
- Configuration Roles & profiles.
- Backup.
- Design of the Updates

- Roles & profiles assessment
- Templates & Standards
- Documentation & protection of workflow in Guru.
- Studio & Guru Training programs.
- Quality Control.
- Documentation & Delivery.
- Upload
- Validation.



Integrated Workflow



Guru 



3

Studio + GURU

Studio (Data Manager) 

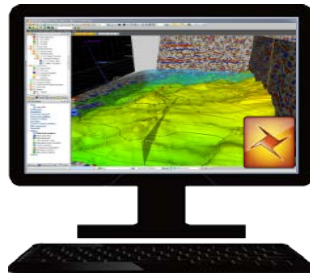


1

Enable large scale data transfer

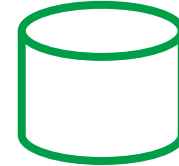
2

Petrel (Data consumer)

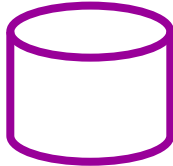


Immediate notifications and alerts to users

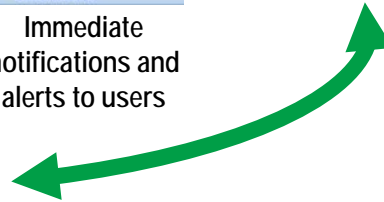
Preserve data integrity across domain platforms with a technical common language



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



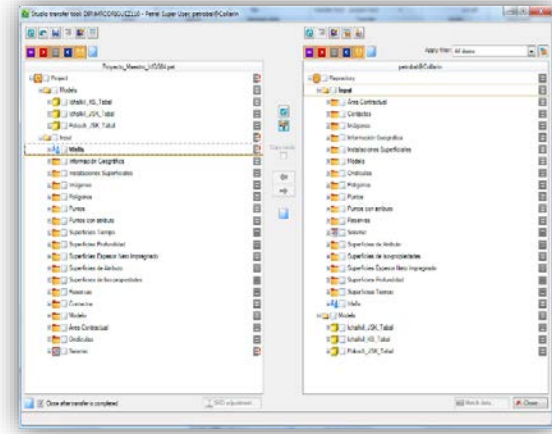
Adapt to technologies through Guidance and training



Studio Pilot Project



Studio Deployment



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%.

Pozos, Localizaciones, Side Tracks, etc.

Nomenclaturas en Petrol

Pozos: Se nombra 3 letras **XXXXXXX** seguido de "y" y "n" correspondiente.
Ejemplo: Miqulca2 Quedaría: **MIQ-2**

Localizaciones: Se nombra 1/2 letras **XXXXXXX** seguido de "y" y "n" correspondiente.
Ejemplo: LOC:EBANCA-1210 Quedaría: **EB-1230**

Re-entradas/SIDE TRACKS: Se nombra 3 letras **XXXXXXX** seguido de "y" y "n" correspondiente.
Ejemplo: Corovado-1002_Reentrada Quedaría: **CCV-1002_REE**

HORIZONTALES: Se nombra 4 caracteres una letra "Y" al final después del número de pozo.
Ejemplo: Ferrelas-14H Quedaría: **FER-14H**

PILOTOS: Se nombra 4 caracteres una letra "Y" al final después del número del pozo.
Ejemplo: Ebano-1234P Quedaría: **EBN-1234P**

Nombre	Código
COMETA	CMF
PAJO BLANCO	PBL
AGUA NADADA	AGN
ZONTLA	ZNT
MIQUETLA	MIQ
CASTILLO DE TEXAYO	CDT
MINA	MNR
METALTUYUCA	MET
COYOTES	CYT
TALIN	TJN
CORRALILLO	CLL
REMOLINO	REM
JILAPA	JIL

Formaciones

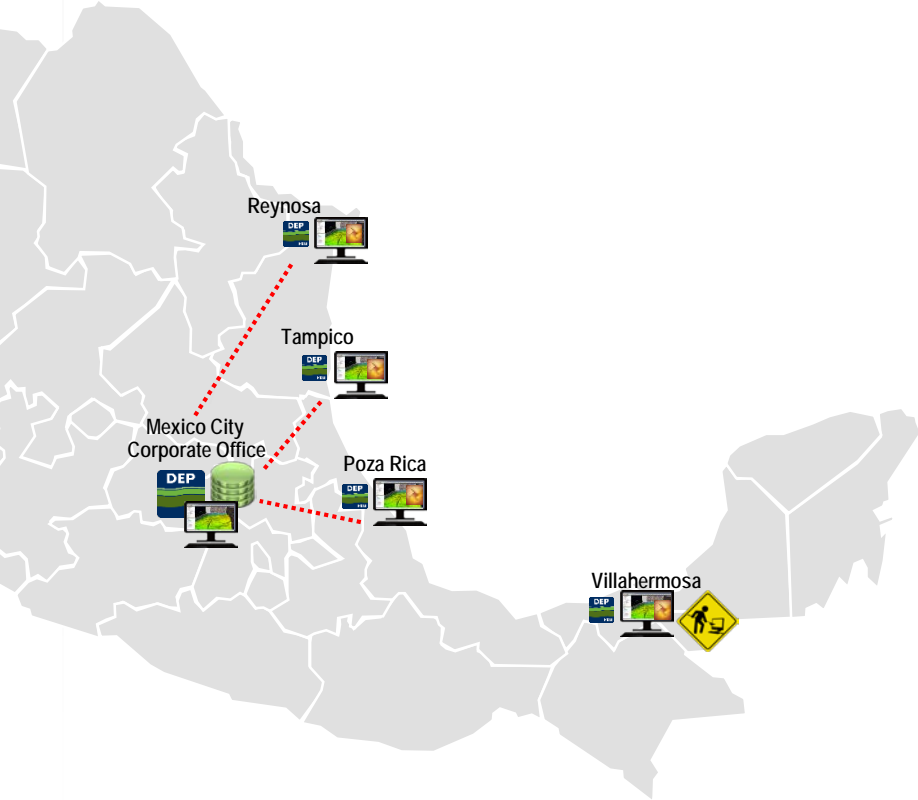
Código	Formación
TTYC	TANTOYUCA
CHTC	CHICONTPEC
AGVN	AGUA NUEVA
TMBR	TAMBIRA
SNFL	SAN FELIPE
GYRL	GUAYABAL
MNDZ	MENCER
ARGN	ARAGÓN
TAMN	TAMÁN
PMNT	PIMENTA
TMP5	TAMALUPAS SUPERIOR
TMPR	TAMALUPAS INFERIOR
SMTG	SANTIAGO
VL SC	VELASCO
CHPT	CHAPOPOTE
LSCB	LA CASITA
MSJN	MISIÓN
ALZN	ALAZÁN
OTIS	OTATES
CHSS	CAHUAGAS

Schlumberger

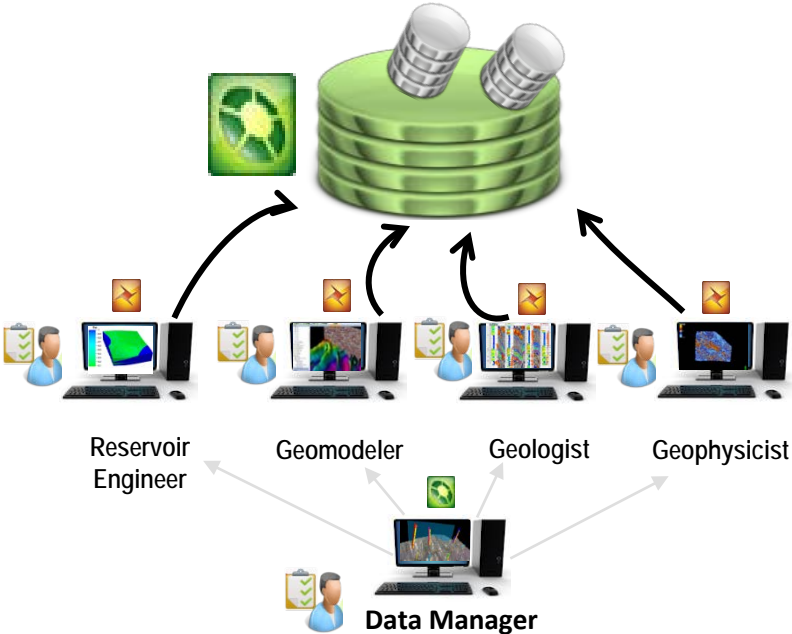
Centralized Infrastructure



Asset Management Scenario



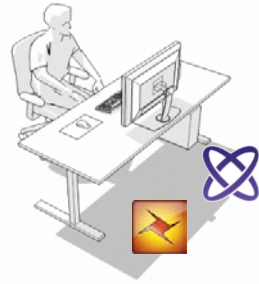
Integrated Study Scenario



Guru Pilot Project

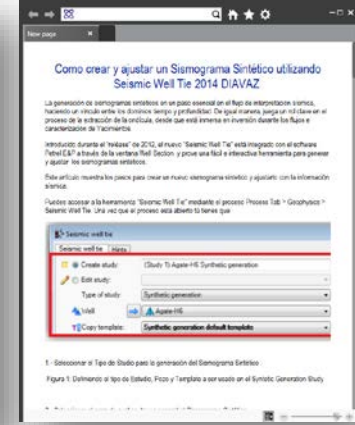
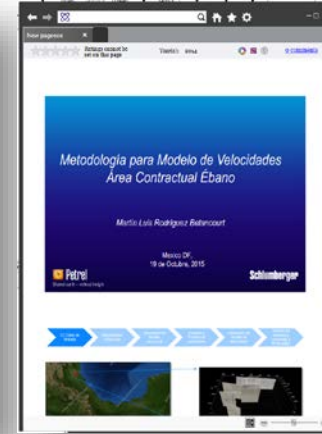


Guru Deployment



25 Customized Guru Workflows:

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



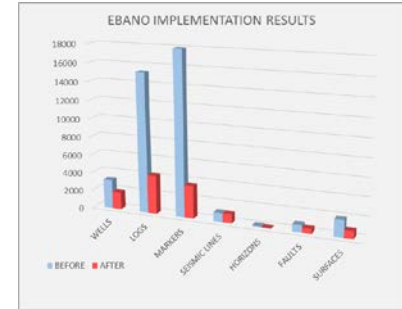
Guru

- Knowledge
- Best Practice
- Training
- Reference

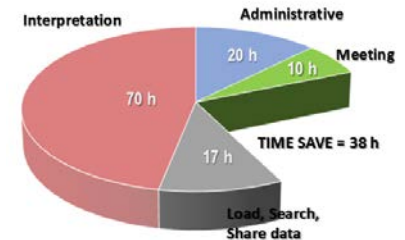
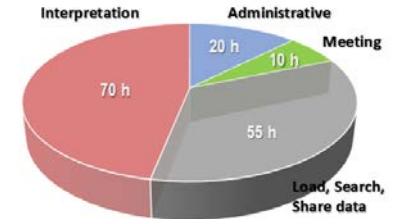
Capture
Unify
Standardize

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.



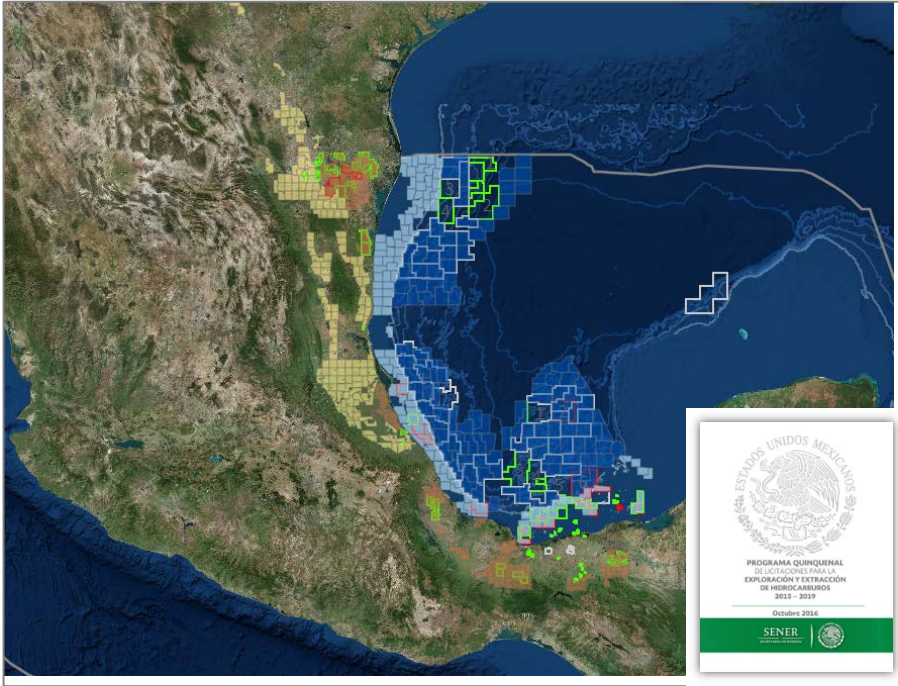
Monthly Work by User (160 h)



Mexico Energy Reform



México Five Years Plan

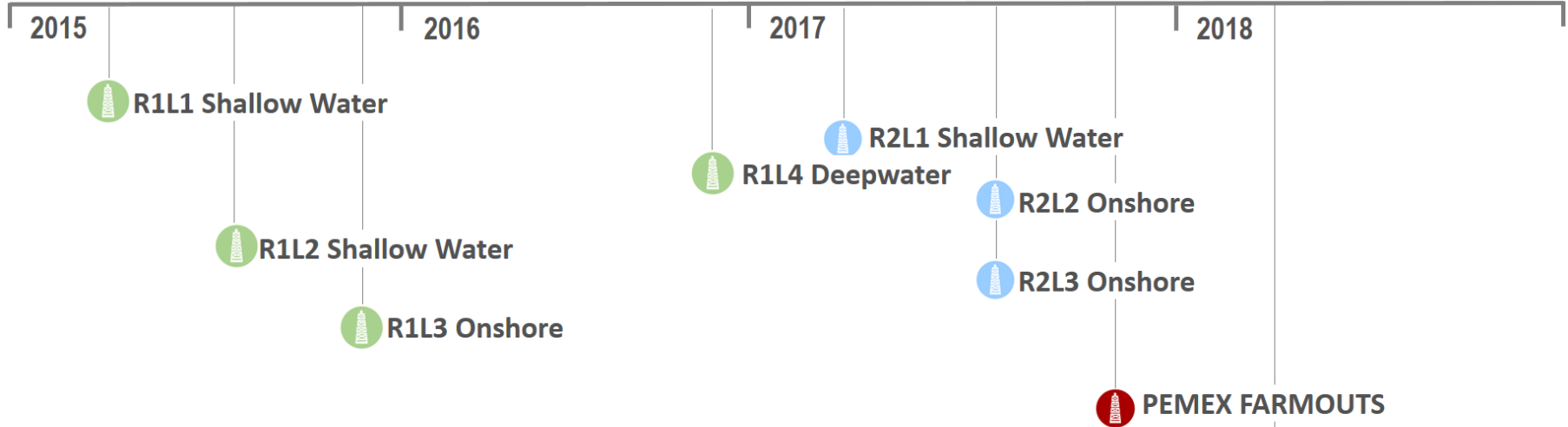


Category	Basin	# of Areas	Total Surface area (km ²)	Prospective Resources (MMboe)			# of Fields	Remaining volume (MMboe)
				Conventional	Unconventional	Total		
Deep water	Perdido	37	36,860.7	1,661.6	0.0	1,661.6	0	0.0
	Cordilleras Mexicanas	33	33,171.8	2,130.0	0.0	2,130.0	0	0.0
	Cuenca Salina	53	47,293.3	2,802.7	0.0	2,802.7	4	500.1
	Burgos Somero	53	21,075.4	1,289.7	0.0	1,289.7	0	0.0
Shallow water	Cuenca Salina	2	34.5	0.0	0.0	0.0	2	2.9
	Tampico-Misantla-Veracruz	38	16,249.0	1,477.9	0.0	1,477.9	7	217.1
	Cuencas del Sureste Somero	59	11,721.3	787.5	0.0	787.5	41	18,617.5
Onshore unconventional	Sabinas Burgos	66	19,271.6	207.5	7,352.8	7,560.3	47	452.9
	Tampico-Misantla	86	24,179.0	188.1	23,578.6	23,766.7	37	26,503.5
	Sabinas Burgos	41	10,286.3	440.0	0.0	440.0	62	346.1
Onshore conventional	Tampico-Misantla-Veracruz	14	2,207.2	5.6	0.0	5.6	8	75.9
	Cuencas del Sureste-Chiapas	33	5,851.4	176.1	0.0	176.1	14	55.5
	Sabinas Burgos	64	10,805.8	582.8	0.0	582.8	31	818.7
	Sabinas Burgos	66	19,271.6	207.5	7,352.8	7,560.3	47	452.9
Total		579	239,007.3	11,749.5	30,931.4	42,680.9	253	47,590.2

- Onshore Unconventional
- Onshore Conventional
- Shallow Water
- Deep Water

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.

Mexico Bid Rounds & Collaborative Productive Environment



- 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.

- Round 1 bidding
- Round 2 bidding
- Coming bid rounds

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.