



Innovarpel 2025

TECHNICAL DAYS

**DIGITAL TRANSFORMATION
& INDUSTRIAL CYBERSECURITY**
IN THE OIL&GAS INDUSTRY

arpel 

JUNE, 24 & 25
Rio de Janeiro, Brazil

SIGEO: 30 years supporting and transforming the work of geoscientists at Petrobras

Fábio Martins Heuseler

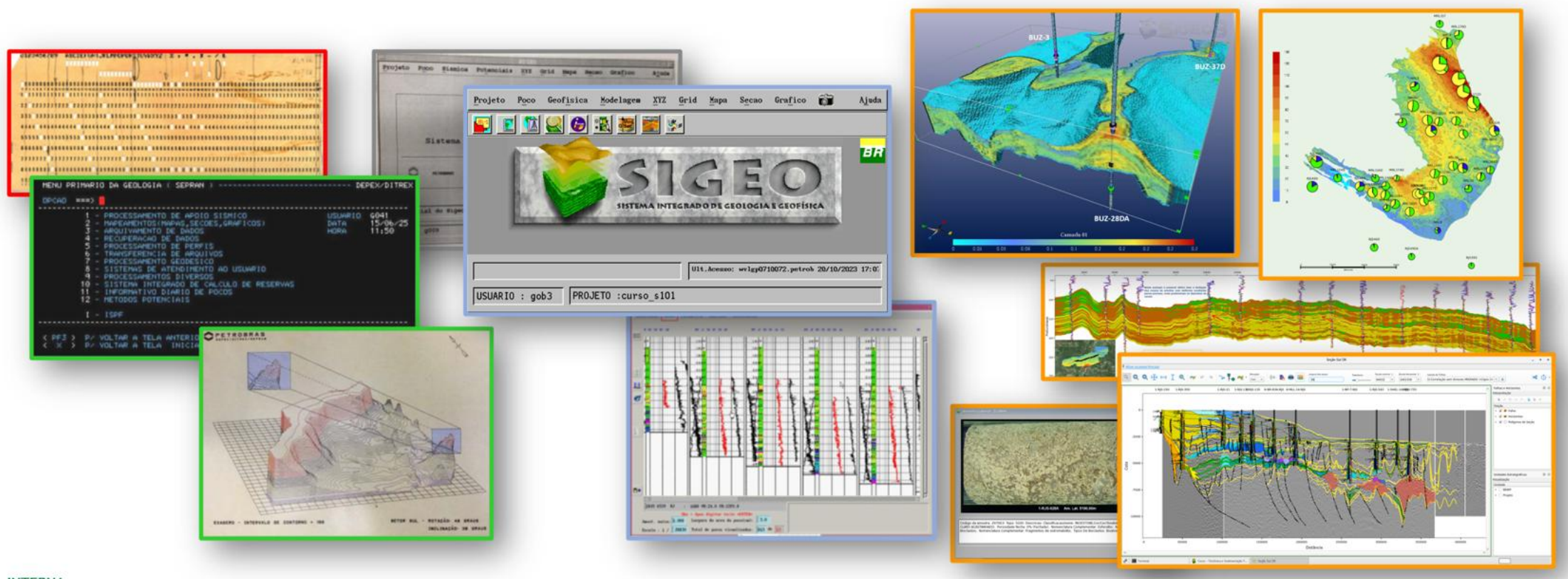
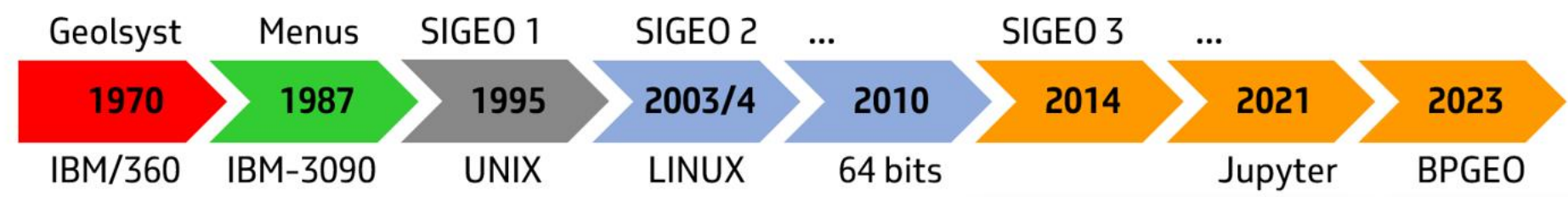
Geological Technology Manager

The technological journey that has shaped integrated geoscience at Petrobras for three decades.

Developed by Petrobras for Petrobras!



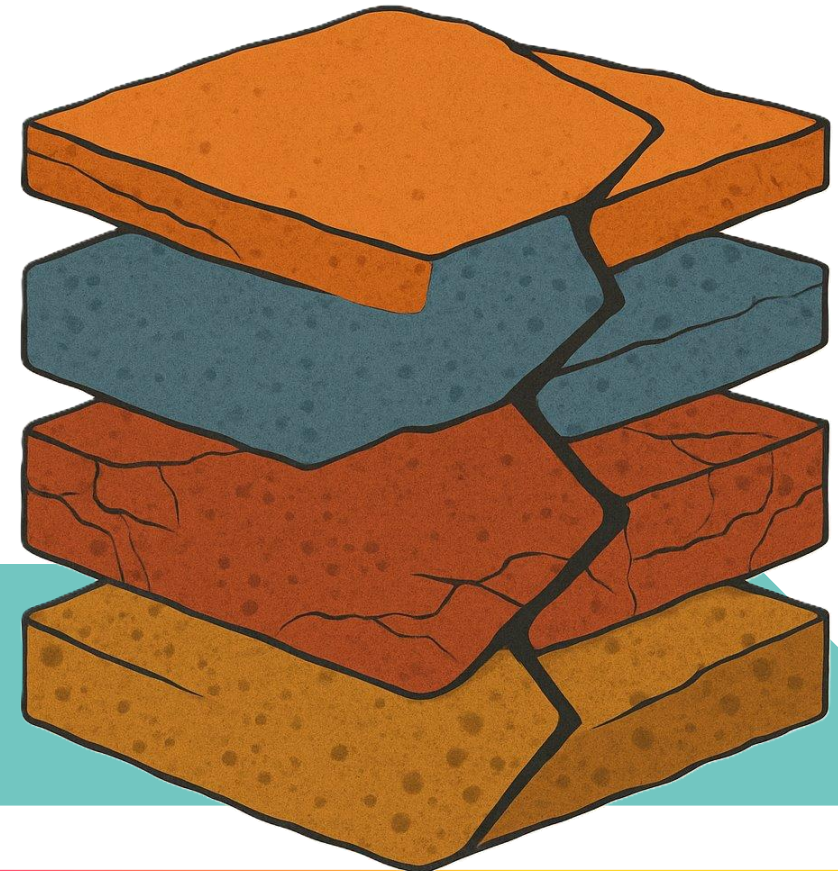
But in fact, the journey begins much earlier...





SIGEO is the main software used in the most diverse stages of the exploratory interpretation process, such as:

- ☐ Stratigraphic Well Correlation
- ☐ Stratigraphic Framework Interpretation
- ☐ Core-log-seismic Integration
- ☐ Geological Modeling Interpretation
- ☐ Geological Predictions Reports
- ☐ Geomechanical Modeling
- ☐ Wellsite Geology
- ☐ Electrofacies Modeling
- ☐ Facies Analysis
- ☐ Geological data management.
- ☐ ...



The system is used by many users, with different profiles, from different areas!

Some Big Numbers...

- ❑ More than **1800** registered **users**;
- ❑ **Monthly** average of **600** users;
- ❑ **17 thousand hours of monthly use**:
 - ✓ geological interpretation,
 - ✓ well monitoring,
 - ✓ data management,
 - ✓ geomechanical and geostatistical modeling...
- ❑ Profiles:
 - ✓ Geoscientists
 - ✓ Reservoir engineers
 - ✓ Well engineer
 - ✓ Researchers (from R&D center)
 - ✓ ...



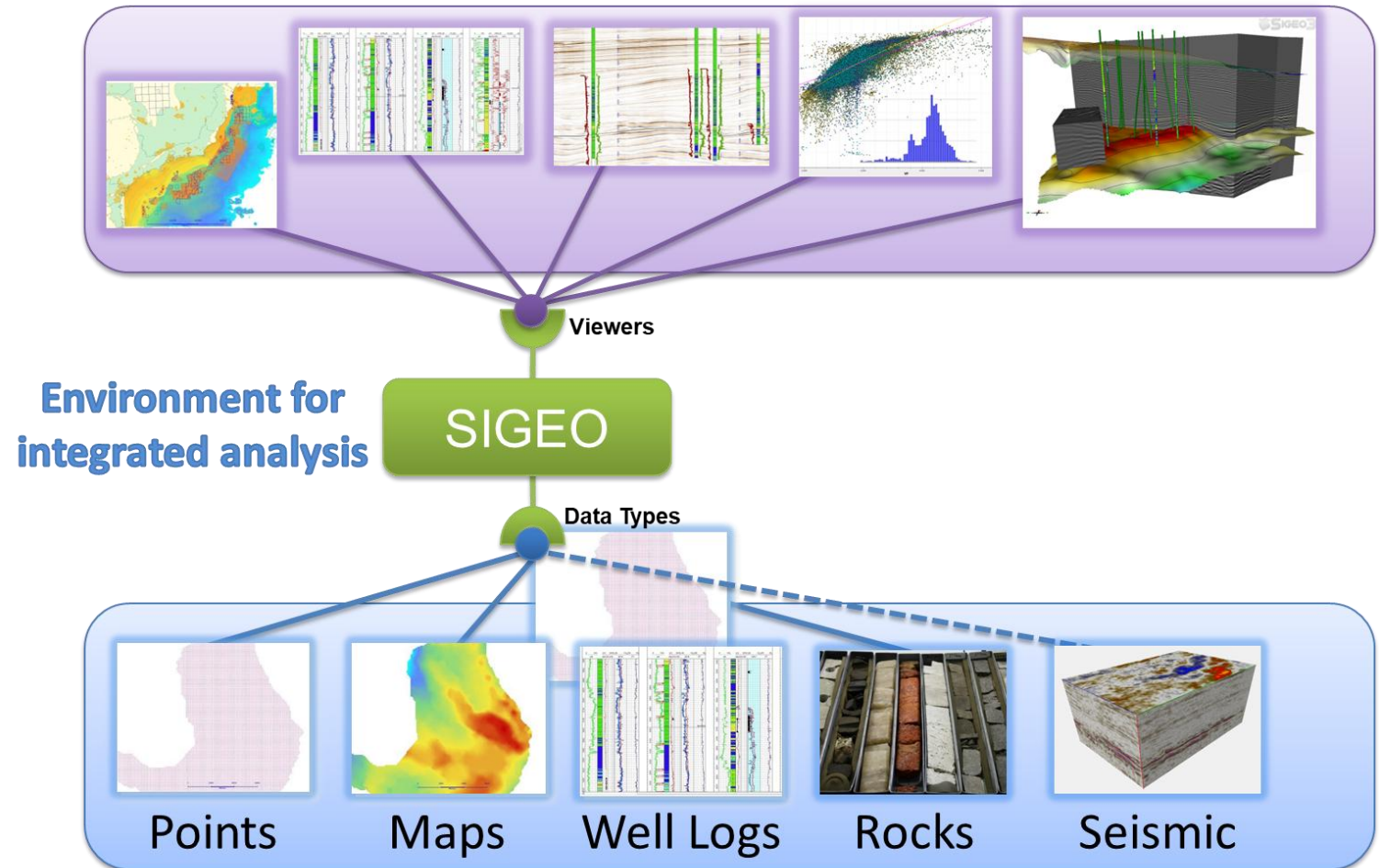
this brings us some big challenges...

Technological challenge



Goals:

- ✓ Optimize user work;
- ✓ Performance;
- ✓ Allow integrated studies;
- ✓ Facilitate maintenance;
- ✓ Integrate with third-party tools.



↻ *constant evolution of architecture...*

“People challenge”



User experience



Developer
experience



Change
management

the people dimension is always the most important...

Our users go above and beyond...

Python calculator

Dados de entrada

Dado de entrada	Variável
1 MD	a

Dados de saída

Variável principal:
MD

Resultado:
Perfil

Nome da variável de saída:
resultado

☐ Definir intervalo

Zona:
CAMP SUP

Quando uma das variáveis de entrada for nula:

- ☒ Atribuir nulo ao resultado.
- ☐ Processar (*).

(*) Valores nulos deverão ser tratados pela fórmula.

PYTHON

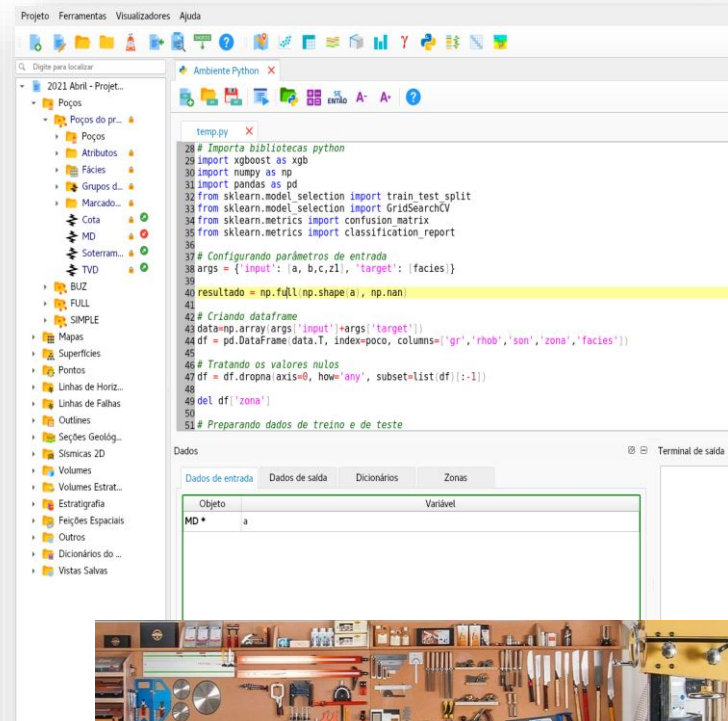
```
# Converte DT Compressional para Densidade
# DT Compressional (dt)

vel = 304800 / dt
c = 0.31
n = 0.25
dens = c * pow(vel, n)
resultado = dens
```

< Voltar ✕ Cancelar Ajuda



Python environment



SIGEO Jupyter

Kernel

Iniciar ●

Conectar ●

Variáveis

Outros

Código

Entradas

Objeto Sigio	Variável Python	Tipo
1 MD	MD	grupo de Perfil
2 GR	GR	grupo de Perfil

☐ DataFrame
 ☐ Coordenadas
 Enviar

Saídas

Objeto Sigio	Variável Python
1 resultado	resultado

+
-
✕
✓

Ajuda



“People challenge”



User experience



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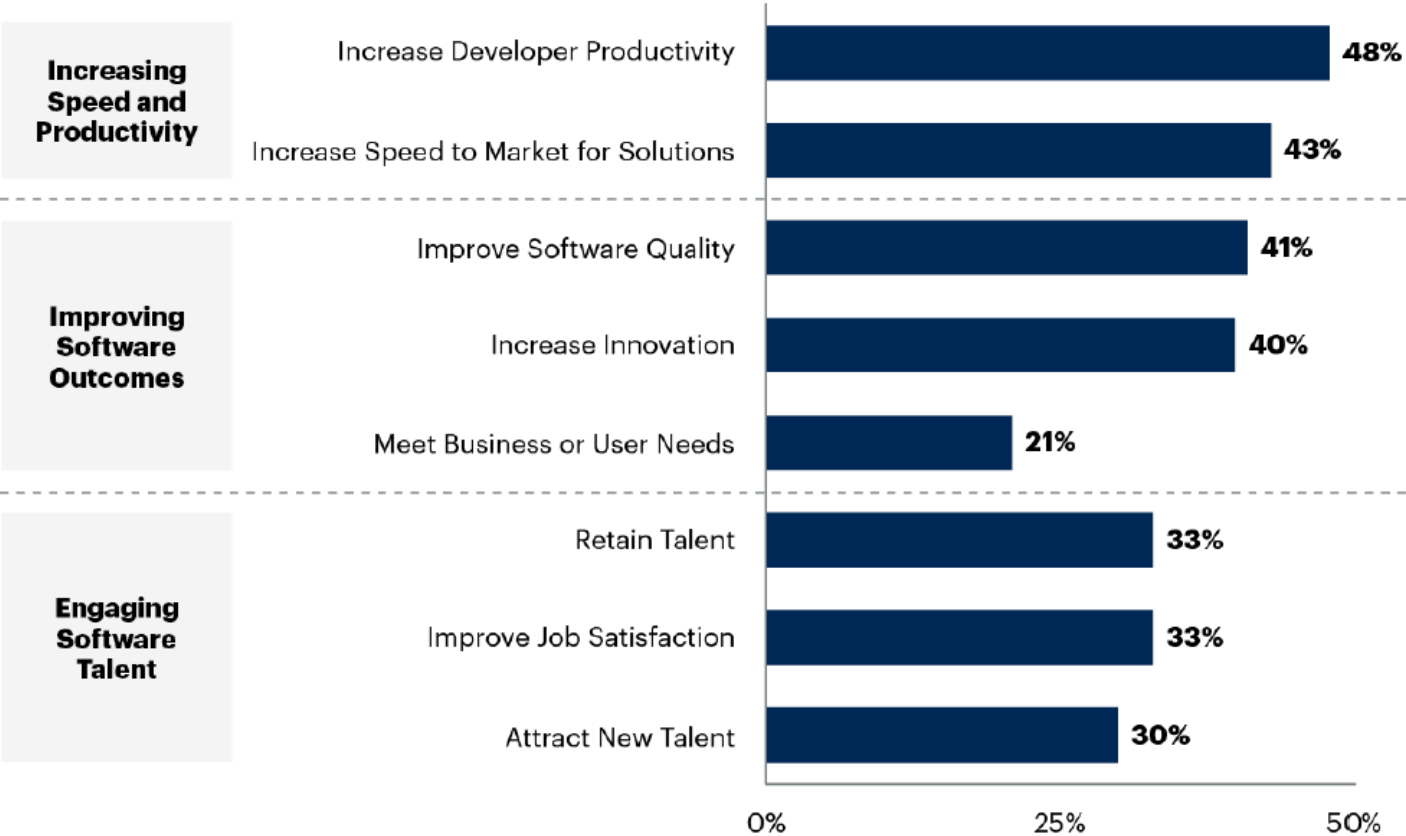
the people dimension is always the most important...



How to give our developers the best tools, environment and culture



Software Engineering Leaders' Top Goals for Developer Experience Initiatives
Percentage of Respondents Selecting Each Goal



n = 135 Software engineering leaders whose organizations have or plan to have some approach to managing the developer experience

Source: 2022-2024 Gartner Technology Adoption Roadmap for IT Leaders Survey
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“People challenge”



User experience








Developer
experience

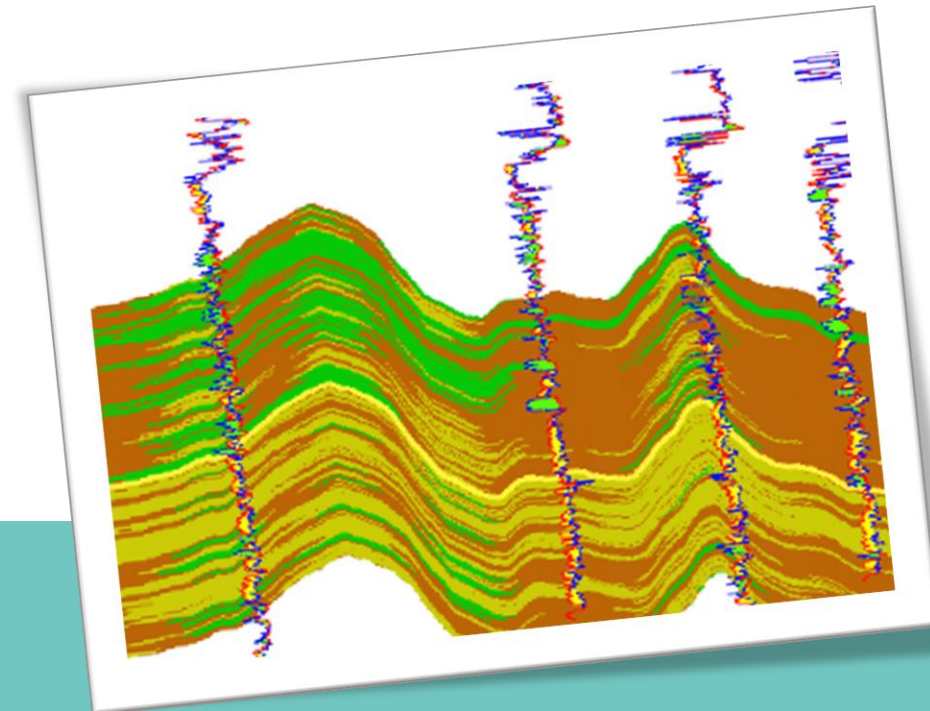


Change
management

the people dimension is always the most important...

How to Deal with the world we are living?

-  Our users are also our biggest contributors to the evolution of the system.
-  How do you keep everyone up to date with the latest?
-  How to convince our users to use what's new?
-  Culture must be observed and respected, but we need to foster innovation.
-  Partnership with Petrobras' Digital Transformation area to build and execute a change management plan.



this is perhaps our biggest challenge today...

Thank You

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