AR360

PERFORM WITH **AIQ**

DISCLAIMER

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Please be aware that client-sourced data can be subject to various factors that may influence its interpretation.

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ABOUT AIQ

AIQ – AI SOLUTIONS FOR THE INDUSTRIAL SECTOR

AIQ was launched in 2020 as a joint venture between global energy company ADNOC and UAE AI specialist, G42.

With AIQ's proven expertise and top talent, our AI solutions will help clients to perform better, protect their teams and equipment, keep operations sustainable and rapidly scale successes up to the enterprise level

2020

Established

Joint Venture

100+

Data Scientists & Developers

20+

Products to Date

14

Award & Recognition Patents filled

A SNAPSHOT OF SOME OF OUR PARTNERS & CLIENTS

AIQ

AIQ'S PORTFOLIO ADDRESSES THE NEEDS OF INDUSTRIAL ASSETS

PERFORM

Applications maximizing productivity with process control and optimizations

PROTECT

Applications offering predictive analytics, maintenance and safety intelligence

SUSTAIN

Emissions monitoring, forecasting and energy optimization applications

SCALE

Public cloud
Private cloud
Hybrid cloud

AIQ'S PORTFOLIO ADDRESSES THE NEEDS OF INDUSTRIAL ASSETS

PERFORM

- **AR**360
- **DRILL**REP
- **ROBO**WELL
- **DRIVE**
- **OPTI**DRILL
- **WELL**INSIGHT
- **ROCK**INSIGHT

PROTECT

- SMARTi
- **DRILL**TECT
- **FORE**SIGHT
- **CORRO**PIPE
- **CORRO**SCAN
- **CORRO**VISION

SUSTAIN

- EMISSION**X**

SCALE

AR360

PERFORM WITH **AIQ**

PERFORM AIQ

THE CHALLENGE

A Field Development Plan (FDP) provides the best technical solution and guide for optimizing the development and production of an oil or gas field.

FDP studies outline the necessary information for producers to assess all the economic decisions required to make a positive economic return from working a field.

Central as they are to field investment and operation, FDPs can be complicated by factors such as reservoir structure uncertainty, petrophysics, the potential for well collusion, and fluid flow interaction. This range of possibilities requires inputs from multiple disciplines, historically working individually.

THE CHALLENGE

Poor initial characterization of reservoirs, or not fully integrating available development technologies can hamper the accuracy of assessments of field production rates.

This can lead to an inaccurate estimation of recovery.

SUBSURFACE & SURFACE

Large number of inactive strings

Challenging reservoir water dynamics

Challenging recovery due to reservoir complexity

Well placement in complex reservoirs

Complex reservoir fluids types

PRODUCTIVITY

Large model size with long runtimes

Time-consuming model review & opportunity generation

INTEGRATION

Lack of integration leads to fallback in production guidance

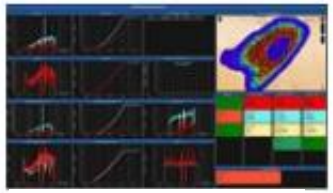
Rapidly outdating models requiring frequent updates

AIQ SOLUTION – APPLICATION APPROACH

AR360 is an automated assessment tool that provides a 360º view of new and existing well characteristics, enabling the creation of high-quality reservoir models that provide Intelligent Well Production Forecasts.

The application is predictive, providing a 75% efficiency gain in user productivity in performing comprehensive reservoir model reviews.

HISTORY MATCH



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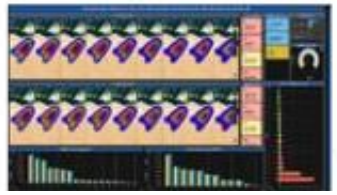
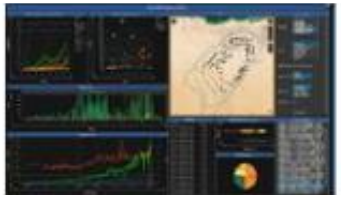
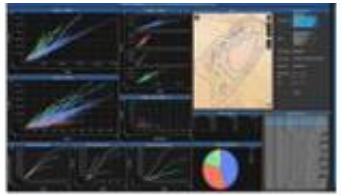


TYPE WELL ANALYSIS



WELL CLUSTERING



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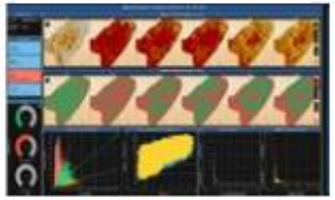

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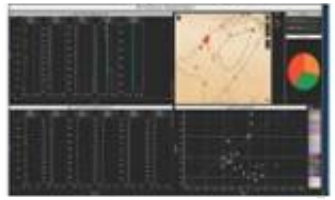

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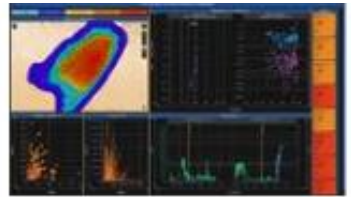
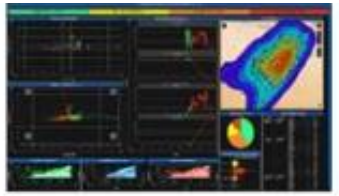
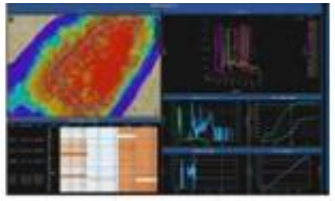


HETROGENTERITY INDEX



CONNECTIONS/VFP/SCAL



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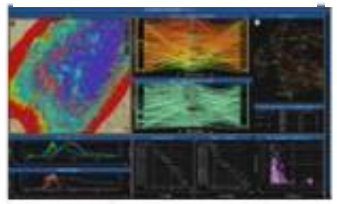

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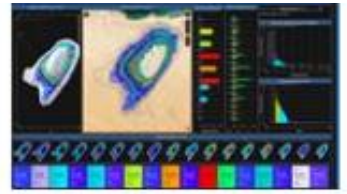

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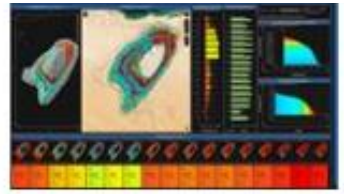


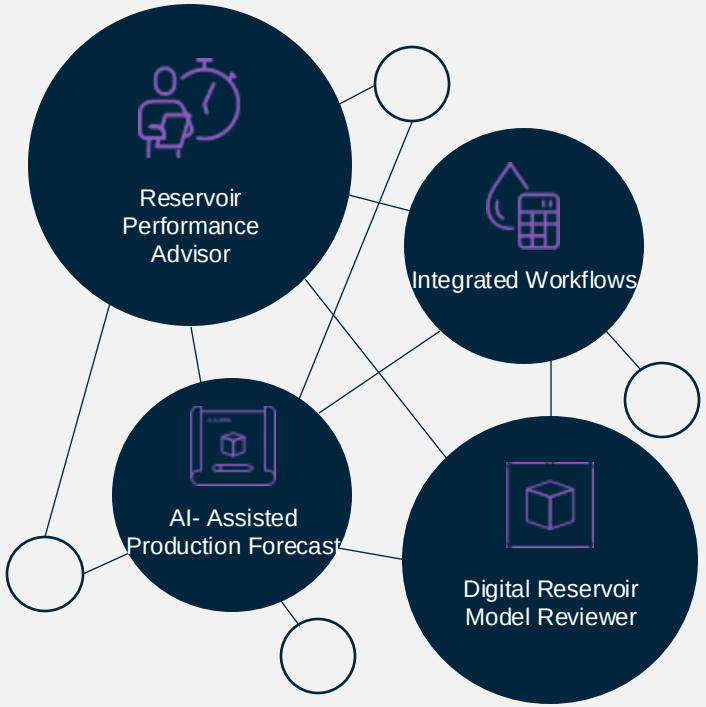
AIQ SOLUTION – APPLICATION APPROACH

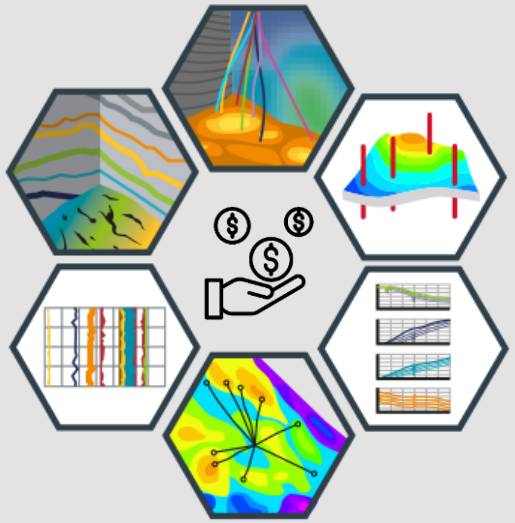
Automating Value Creation

Raising efficiency of reservoir understanding to a whole new level: From months to days

FROM "SILOS"	TO "SYNERGY"	VALUE CREATION

- History Match Analysis
- Volumetrics
- Chan Analysis
- New Well Productioin Forecast
- Simulation Parsers
- Opportunity Index
- Type Well Analysis
- Well Clustering
- Existing Well Production Forecast
- Heterogeneity Index
- Analytics Map





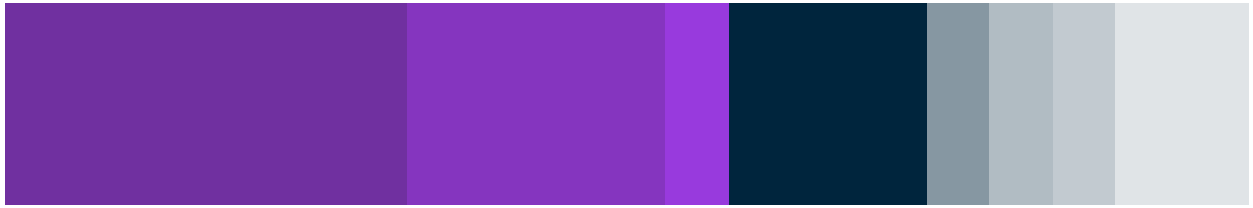
AIQ SOLUTION – APPLICATION APPROACH

Multi-disciplinary platform on the Cloud - AR360 democratizes access to all reservoir model data to all asset team members

WHY?

CONVENTIONAL SILO WORKFLOWS

FIND DATA &QAQC | DATA ANALYSIS | INTEGRATE WITH OTHER DISCIPLINES | INSIGHTS AND ACTIONS



Replacing multiple domain applications

AR360

MINIMIZE DATA INTEGRATION TIME | AUTOMATED WORKFLOWS | ACCELERATE INSIGHTS TO ACTIONS

AIQ SOLUTION – APPLICATION APPROACH

Multi-disciplinary platform on the Cloud - AR360 democratizes access to all reservoir model data to all asset team members

WHO?

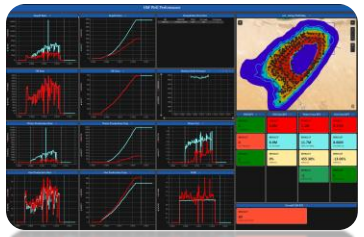
AIQ SOLUTION – APPLICATION APPROACH

01

RESERVOIR PERFORMANCE ADVISOR

- Automated Assessment of Reservoir Model Quality and predictive capability
- Advisory system to enhance future model generation

HISTORY MATCH



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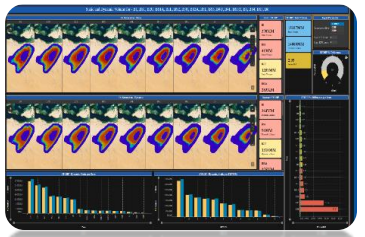
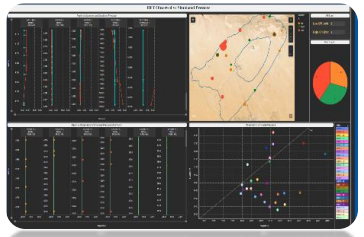


PRESSURE / RFT/ MDT



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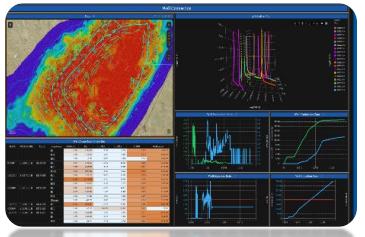

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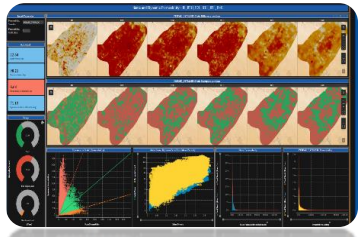

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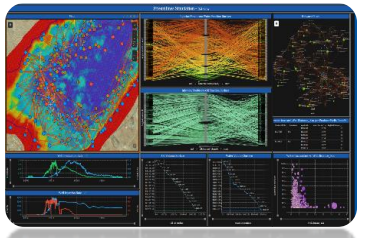


AIQ SOLUTION – APPLICATION APPROACH

02

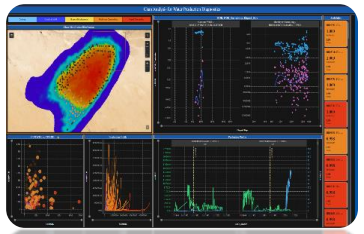
RESERVOIR PERFORMANCE ADVISOR

- Automated Assessment of Reservoir Model Quality and predictive capability
- Advisory system to enhance future model generation

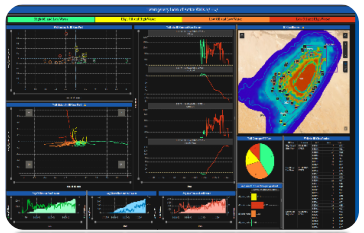
TYPE WELL ANALYSIS

WELL CLUSTERING

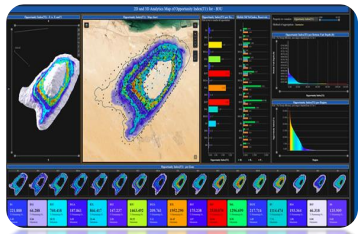
CHAN ANALYSIS



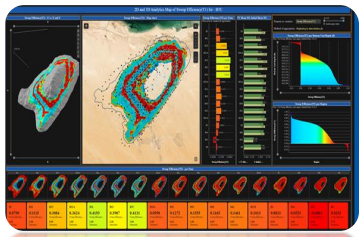
HETEROGENEITY INDEX



OPPORTUNITY INDEX



SWEEP EFFICIENCY

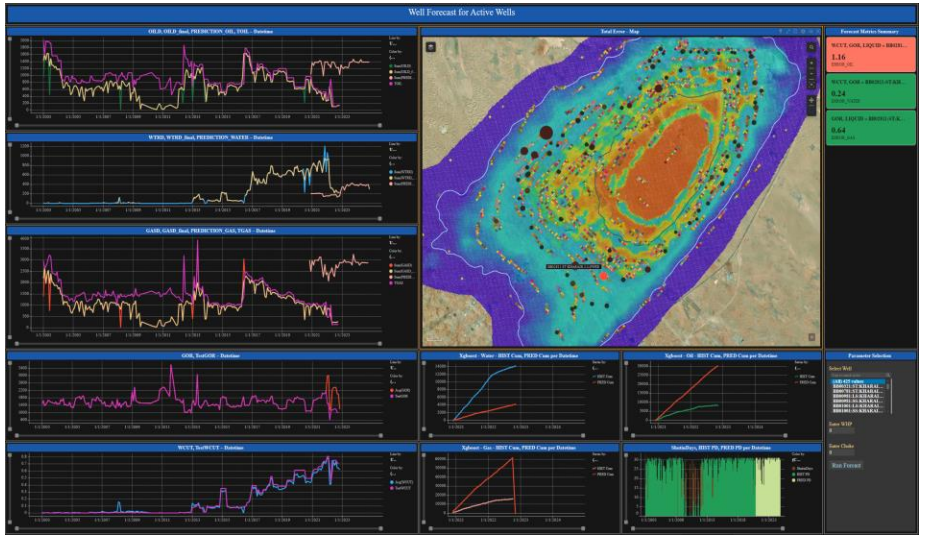


AIQ SOLUTION – APPLICATION APPROACH

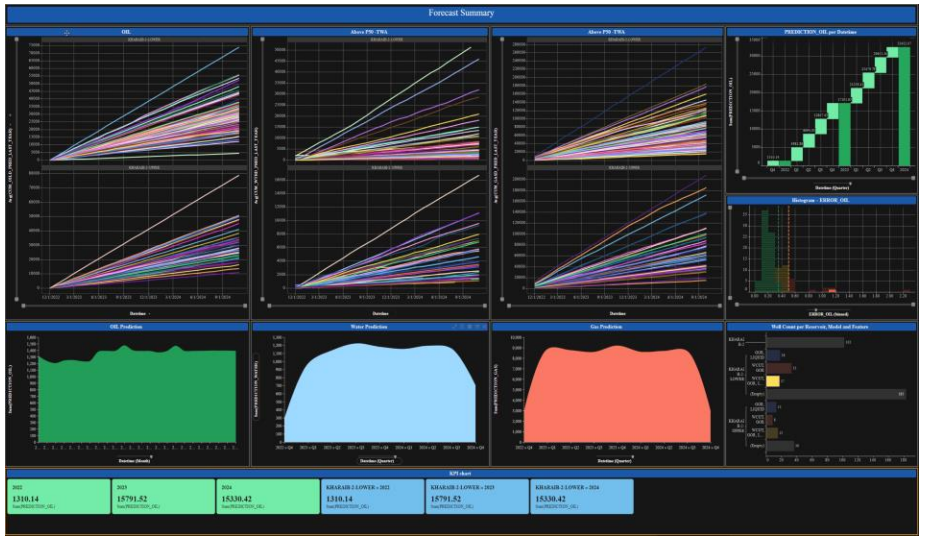
03

AI-ASSISTED PRODUCTION FORECAST

- Automated Assessment of Reservoir Model Quality and predictive capability
- Advisory system to enhance future model generation



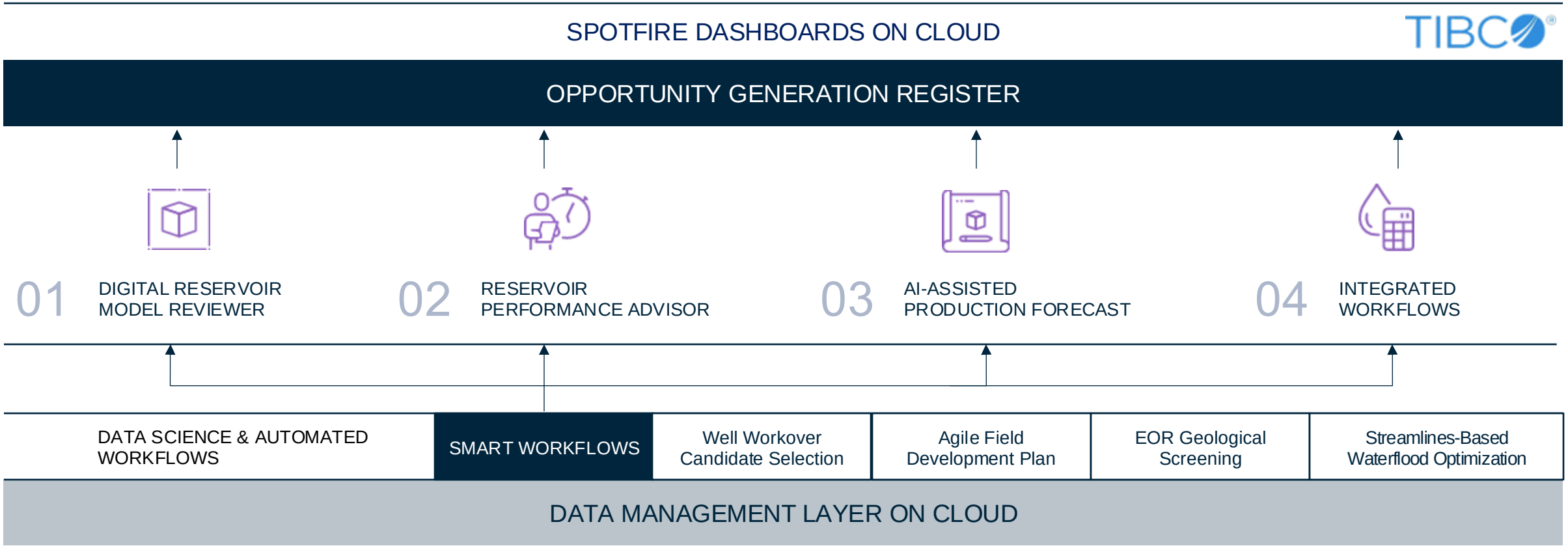
EXISTING WELLS – INTELLIGENT PRODUCTION FORECAST



NEW WELLS – INTELLIGENT PRODUCTION FORECAST

AIQ SOLUTION – APPLICATION APPROACH

AR360 INTEGRATED FRAMEWORK



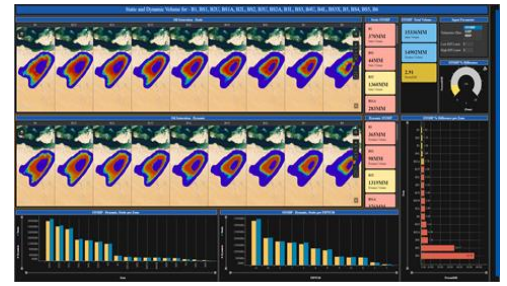
AIQ SOLUTION – APPLICATION APPROACH

DIGITAL RESERVOIR MODEL REVIEWER (DRM)

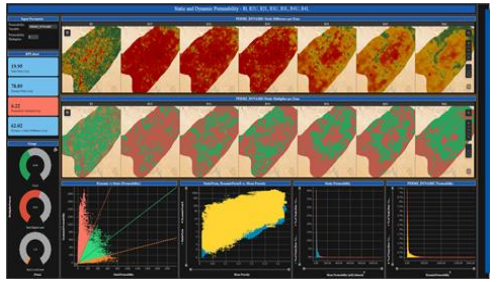
CHALLENGES

- Time-consuming and labor-intensive workflows to assess reservoir model accuracy and predictive capability.

COMPREHENSIVE STATIC & DYNAMIC MODEL REVIEW



VOLUMETRICS



PROPERTIES

HISTORY MATCH

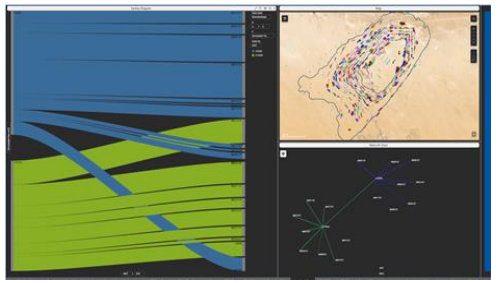
AIQ SOLUTION – APPLICATION APPROACH

DIGITAL RESERVOIR MODEL REVIEWER (DRM)

SOLUTION

- Software agnostic and highly scalable
- Automated and structured assessment of reservoir model quality and gaps between all assets.
- Advisory system to enhance quality of future models and predictive capability of existing reservoir models.

COMPREHENSIVE STATIC & DYNAMIC MODEL REVIEW



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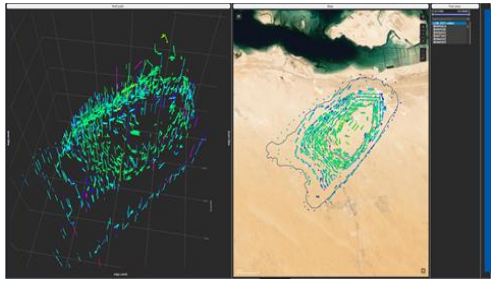
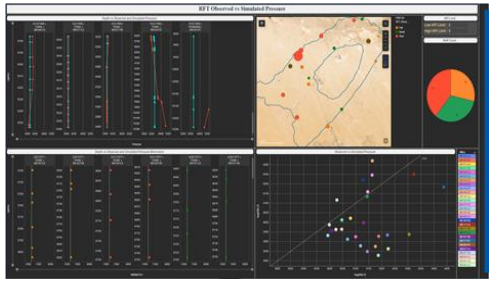


WELL CONNECTIONS



PRESSURE / RFT / MDT

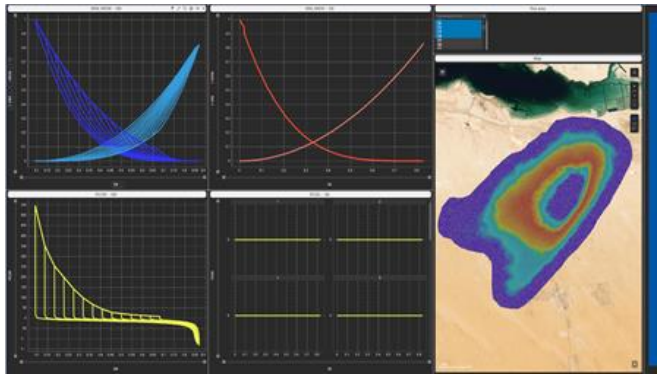
AIQ SOLUTION – APPLICATION APPROACH

DIGITAL RESERVOIR MODEL REVIEWER (DRM)

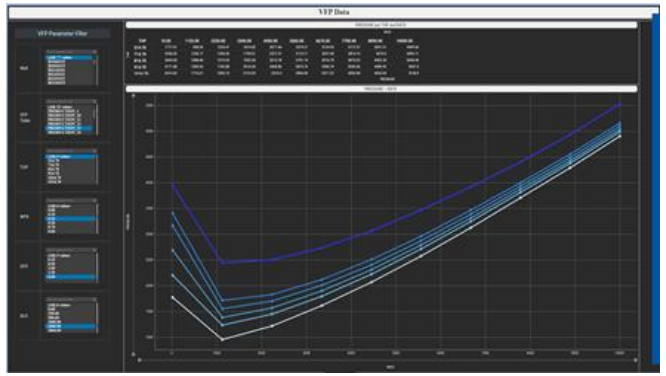
VALUES

- 75% efficiency gain in people productivity in performing comprehensive reservoir model reviews of all assets.
- Provide assurance to reservoir model quality and predictive capability.
- Democratize access to subsurface models

COMPREHENSIVE STATIC & DYNAMIC MODEL REVIEW



SCAL



WELL CONNECTIONS

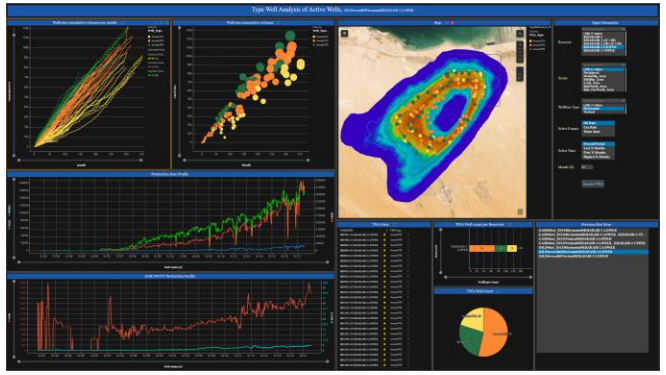
AIQ SOLUTION – APPLICATION APPROACH

ADVISOR PRESERVOIR PERFORMANCE (RPA)

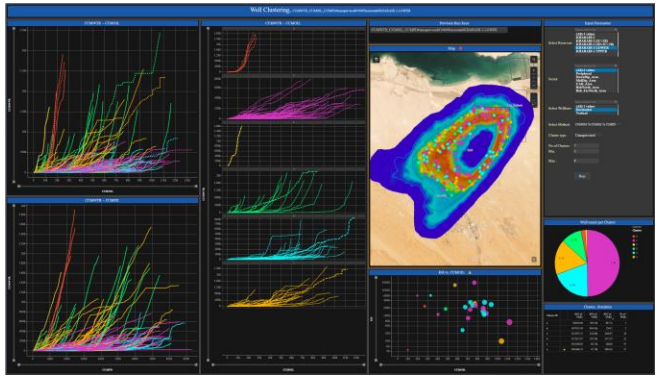
CHALLENGES

- Lack of automated and structured screening processes to identify opportunities to optimize Reservoir Management workflows for mature assets. (70% RF)

COMPREHENSIVE STATIC & DYNAMIC MODEL REVIEW



TYPE WELL ANALYSIS



WELL CLUSTERING

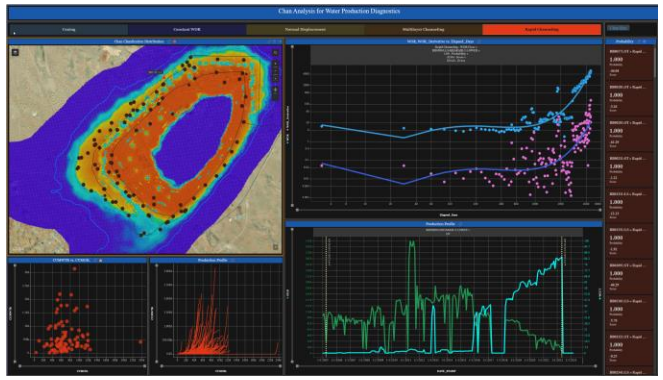
AIQ SOLUTION – APPLICATION APPROACH

ADVISOR PRESERVOIR PERFORMANCE (RPA)

SOLUTION

- Identification of underperforming reservoir areas and wells with relevant recommendations harnessing automation and machine learning.

SOLUTION MODULES



CHAN ANALYSIS

HETEROGENEITY INDEX

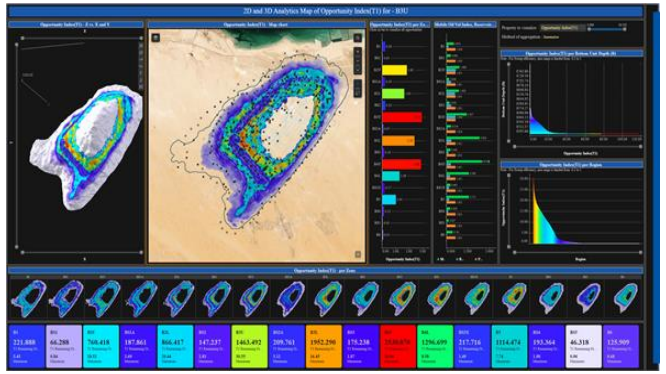
AIQ SOLUTION – APPLICATION APPROACH

ADVISOR PRESERVOIR PERFORMANCE (RPA)

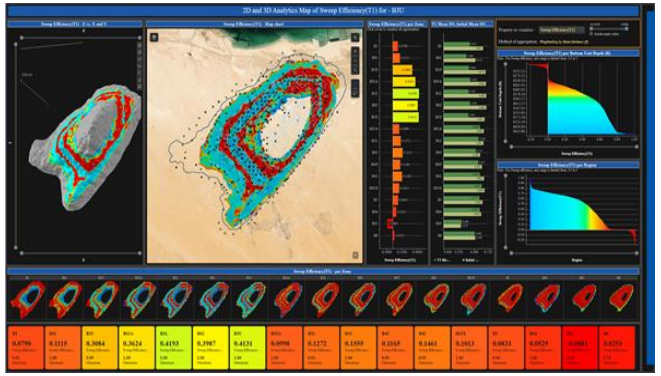
VALUES

- Generate insights to enhance well performance and extend the life of 10-30% of active wells by 10-20%.
- Improve and accelerate reservoir understanding by 5X.
- Reduce number of inactive strings by 10% in one asset within 25 year period.

SOLUTION MODULES



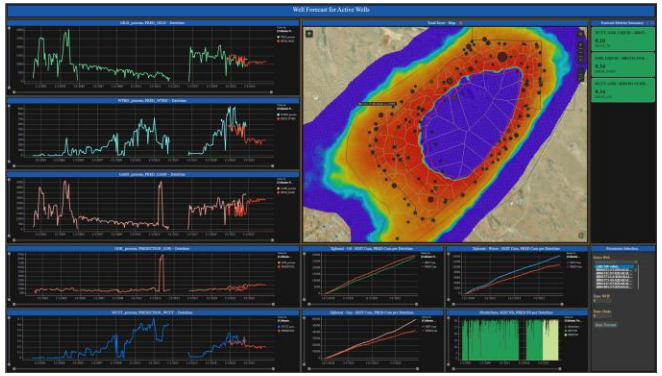
OPPORTUNITY INDEX



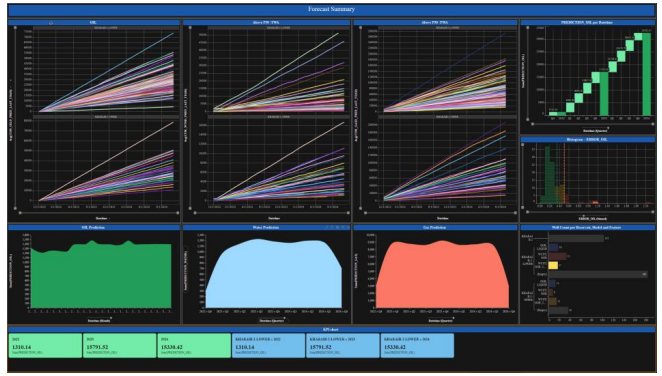
SWEEP EFFICIENCY

AIQ SOLUTION – APPLICATION APPROACH

SOLUTION MODULES



EXISTING WELLS – INTELLIGENT PRODUCTION FORECAST



SHORT-TERM PRODUCTION PLANNING

CHALLENGES

- Current production forecasting from simulation models are generally geared towards long-term optimization and take months to generate.
- Absence of fast and accurate forecasting methods on the short term (1-2 years) to plan for production guidance.
- No data driven tools based on historical production data to test infill well scenarios.

SOLUTIONS

- Machine Learning based forecasting of production performance of wells towards efficient infill drilling planning and business plan assessments.

VALUES

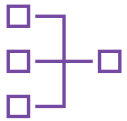
- Improve production forecast guidance and reduce costs by 5-10% associated with drilling of new wells.

AIQ SOLUTION – APPLICATION APPROACH

WELL WORKOVER CANDIDATE SELECTION

INSIGHTS

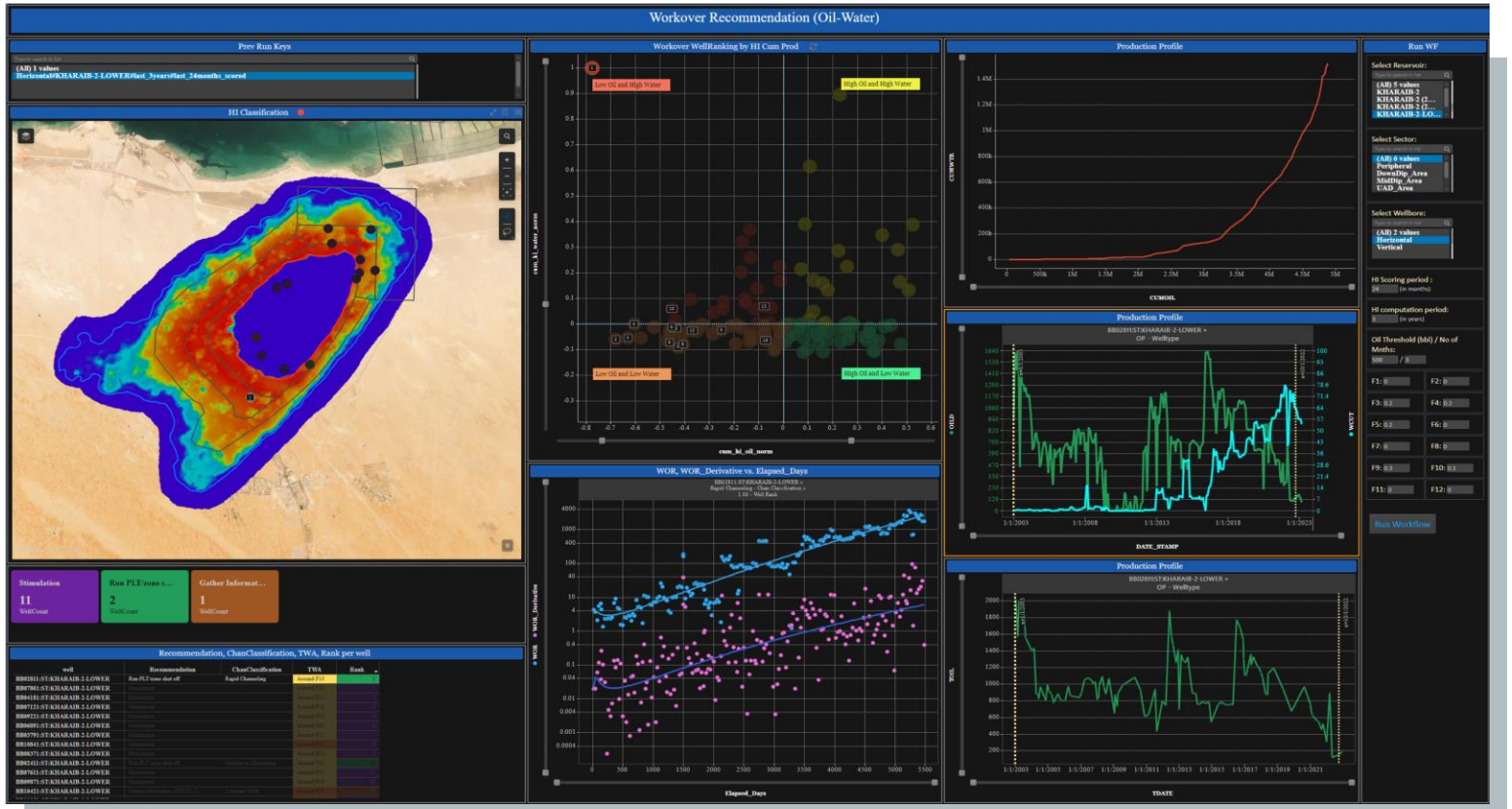
- Identify workover candidates for choke down and water shutoff operations for high water cut producers.
- Assists to delineate workover candidates for re-perforation and stimulation operations for low productivity wells.
- A map displaying wells classified into different workover types can reveal areal or regional trends.



FEATURES

- Screening of active wells for **low productivity** or **high water** or **gas** producing wells using Heterogeneity Index Workflow.
- Apply Chan Analysis for high producing water wells to assess water production mechanism.
- Well workover recommendations ranking for each well by workover type.
- Integration with simulation model results to improve decision making.

AIQ SOLUTION – APPLICATION APPROACH



ACTIVE WELLS

+

HETEROGENEITY INDEX

+

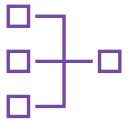
CHAN ANALYSIS

AIQ SOLUTION – APPLICATION APPROACH

STREAMLINES BASED WATERFLOOD OPTIMIZATION

INSIGHTS

- Performance Analysis of production and injection wells.
- Enables identification of potential workover candidates to resolve production / injection issues and reach optimum waterflood performance.
- Provide recommendations for the following:
- Wells with potential oil production Increase
- Producer wells to convert to injectors
- Injectors with potential injection increase
- Injectors to shutdown injection

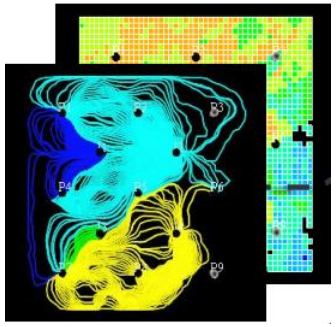


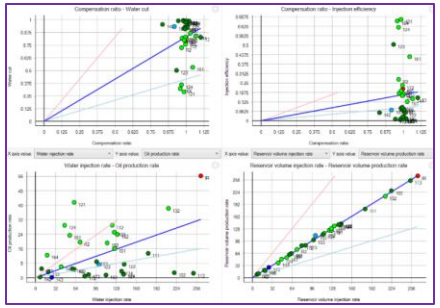
FEATURES

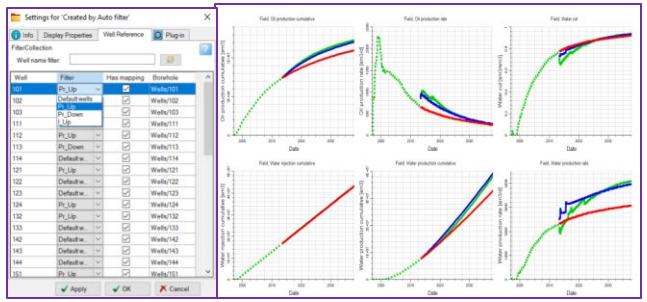
- Holistic view of waterflood optimization opportunities for the period of analysis selected by the user.
- User defined producer / injector waterflood optimization logic selection criteria.
- Waterflood analytics plot with optimization insights.
- Could be used for current operations or in future FDP scenarios

AIQ SOLUTION – APPLICATION APPROACH

STREAMLINES BASED WATERFLOOD OPTIMIZATION







01 DYNAMIC MODEL & STREAMLINES

Injector – producer pairs identification and mapping

Flow and phase ratios estimations.

02 WATERFLOOD ANALYSIS (CROSS-PLOTS, TABLES ETC.)

Comprehensive analysis of production / injection wells. Identification and selection of groups:

- Production / injection increase / decrease
- Production / injection shutdown
- Convert producer to injector.

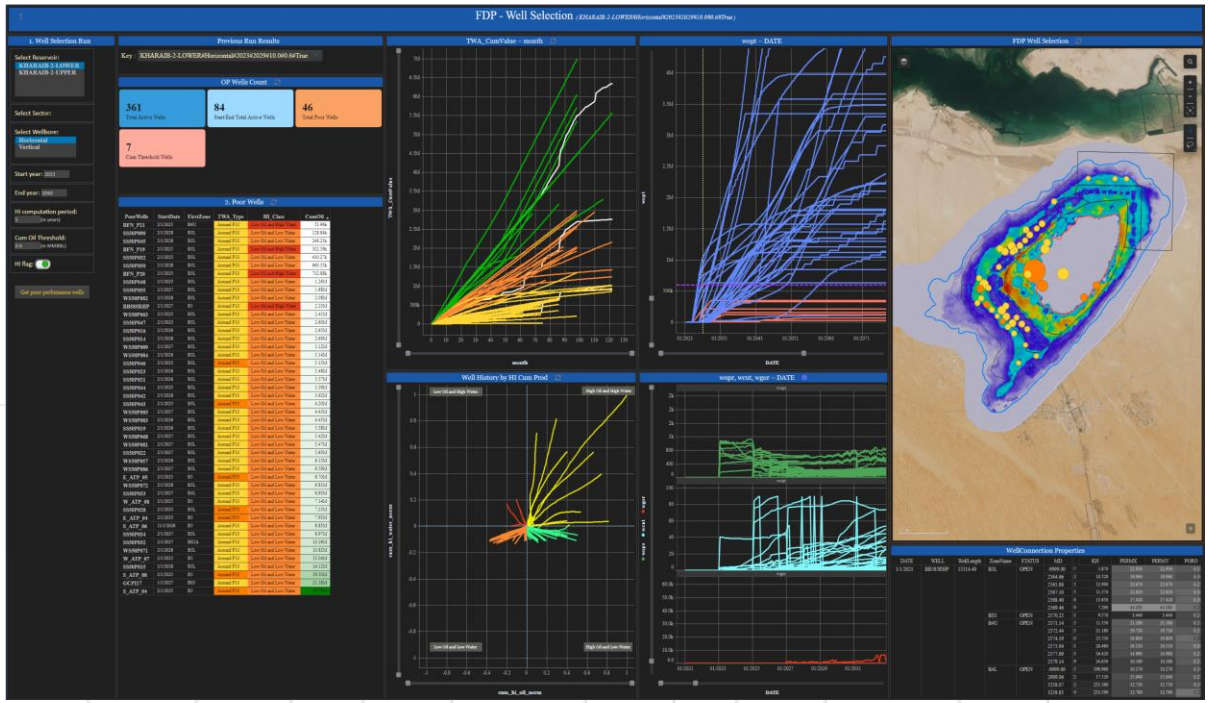
03 WORKOVER SELECTION & OPTIMIZATION

Select potential workover candidates to debottleneck waterflood operations.

Create and manage workover strategies.

Assess an effect of workovers to select most optimal actions/

AIQ SOLUTION – APPLICATION APPROACH

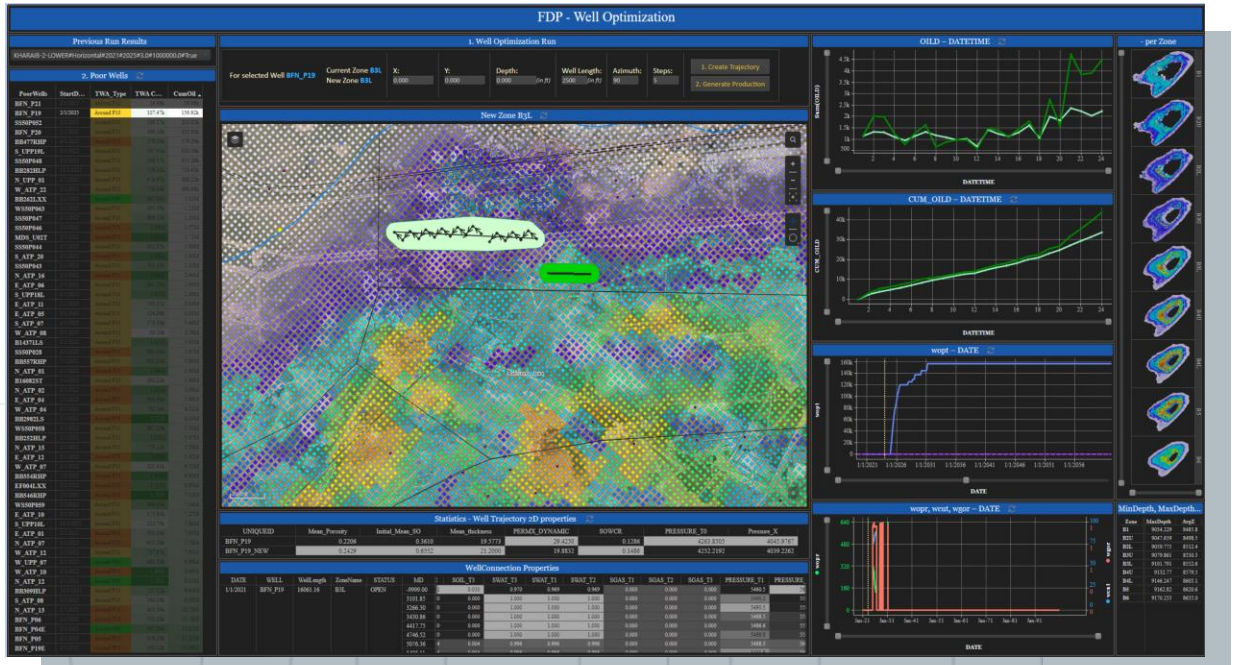


AGILE FIELD DEVELOPMENT PLANNING (AFDP)

FEATURES:

- Screening of poor future FDP wells (5Y BP or all future wells)
- Run Heterogeneity Index (HI) and TWA workflows to assess well performance
- Rank poor wells based on HI + TWA and Cum Volumes
- User selected location for new infill drilling forecast.
- Capable of Data Driven forecasting of all three phases – oil, water and gas.

AIQ SOLUTION – APPLICATION APPROACH



AGILE FIELD DEVELOPMENT PLANNING (AFDP)

INSIGHTS:

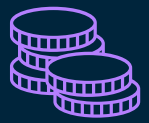
- Rapid optimization of well placement for poor wells under multiple scenarios
- Assist in improving production from new infill wells through identification and assessment of better drilling locations.
- Provide scenarios to simulation engineer to assess and simulate the best long term production profiles

AR360

PERFORM WITH **AIQ**

Enables the creation of high-quality reservoir models that deliver Intelligent Well Production Forecasts, providing up to 75% efficiency gain in user productivity

BUSINESS VALUE & BENEFITS OF AR360



REDUCE COSTS

Reduce number of new infill wells by 5-10% in one reservoir over five years. Boost waterflood program to improve oil recovery per barrel of water injected by up to 10%.

INCREASE PRODUCTION

Extend life of existing wells by 10% in one reservoir (~5% of wells) over five years. Improve production from new wells by 30% in one reservoir (~5% of new infill wells) over five years

IMPROVE EFFICIENCY GAIN

Speedup reservoir model review and opportunity generation processes by 75%.

INTRODUCING THE PERFORM BY AIQ

PERFORM BY AIQ

Delivers innovative techniques and applications maximizing productivity with process control, optimizations and increased reservoir understanding.

The pioneering, web-based AI-powered application equips geoscientists with the next-generation of reservoir characterization and management tools.

PERFORM
AIQ

INTRODUCING THE PERFORM BY AIQ

PERFORM
AIQ

OPTIDRILL
PERFORM WITH AIQ

Automated DDR reporting interpretation

DRILLREP
PERFORM WITH AIQ

AI-driven drilling performance improvement and reduction of well development time

ROBOWELL
PERFORM WITH AIQ

Automated well operation management with desired production targets

PERFORM AIQ

INTRODUCING THE PERFORM BY AIQ

ROCKINSIGHT
PERFORM WITH AIQ

Thin section interpretation automation reducing the time for analysis to seconds

WELLINSIGHT
PERFORM WITH AIQ

AI driven borehole image interpretation

AR360
PERFORM WITH AIQ

360º view of wells, enabling the creation of reservoir models & production forecasts

DRIVE
PERFORM WITH AIQ

Automatic QA/QC of reservoir models and consistency analysis versus reference cases

THANK YOU

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