PERFORM

AIQ

ROBOWELL

PERFORM WITH **AIQ**

POWERING A **SUSTAINABLE** TOMORROW

www.aiqintelligence.ae

THE CHALLENGE

The Oil and Gas industry faces several key challenges that need to be addressed for optimal performance and efficiency. These challenges include minimizing well and facility instability, as well as trips, which can disrupt operations significantly, leading to costly downtime and reduced production output

A further challenge is the lack of continuous operational optimization in response to dynamically changing field conditions. Without a proactive approach to optimization, valuable opportunities to maximize production and minimize costs based on real-time data insights are missed

Additionally, leveraging real-time data is crucial for effective decision-making and performance improvement. The availability of real-time data from various sensors and monitoring systems provides valuable insights into the current status of wells and facilities

01

Addressing industry challenges requires a comprehensive approach that integrates real-time data utilization with autonomous well operations. By leveraging advanced technologies, AI and analytics, the business can achieve significant improvements in operational efficiency, productivity, and overall performance.

02

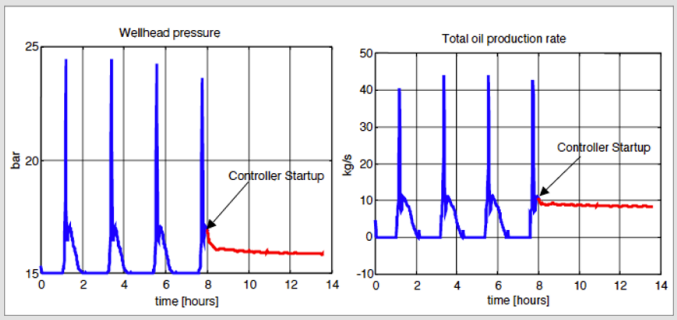
Currently, the most widely used technique to manage the effectiveness of oil well production requires continuous supervision of each well by operations personnel, who have to make frequent adjustments to the available control variables.

03

This supervision helps stabilize the production rate but can be extremely time and resource-consuming, especially when considering different types of wells with varying characteristics, designs, equipment, and lifting methods.

EXAMPLE OF STABILIZATION OF WELL OIL PRODUCTION PROCESS BY ACTIVE CHOKING

(FREQUENT ADJUSTMENT OF GAS AND PRODUCTION CHOKES)



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Application Approach

AIQ's **ROBO**WELL is designed to assist in the stabilization of well production in the most economically efficient manner possible

The application is set up to eliminate the need for the operations personnel to constantly monitor and adjust the well-operating variables

ROBOWELL is able to maintain stable operating conditions and optimize well production while considering the objectives to minimize gas lift consumption and operating constraints such as minimum bottom hole pressure, maximum flow line pressure, and maximum annulus pressure (MAASP), among other factors

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Application Approach

From a location and operation standpoint,
ROBOWELL is divided into two main components:

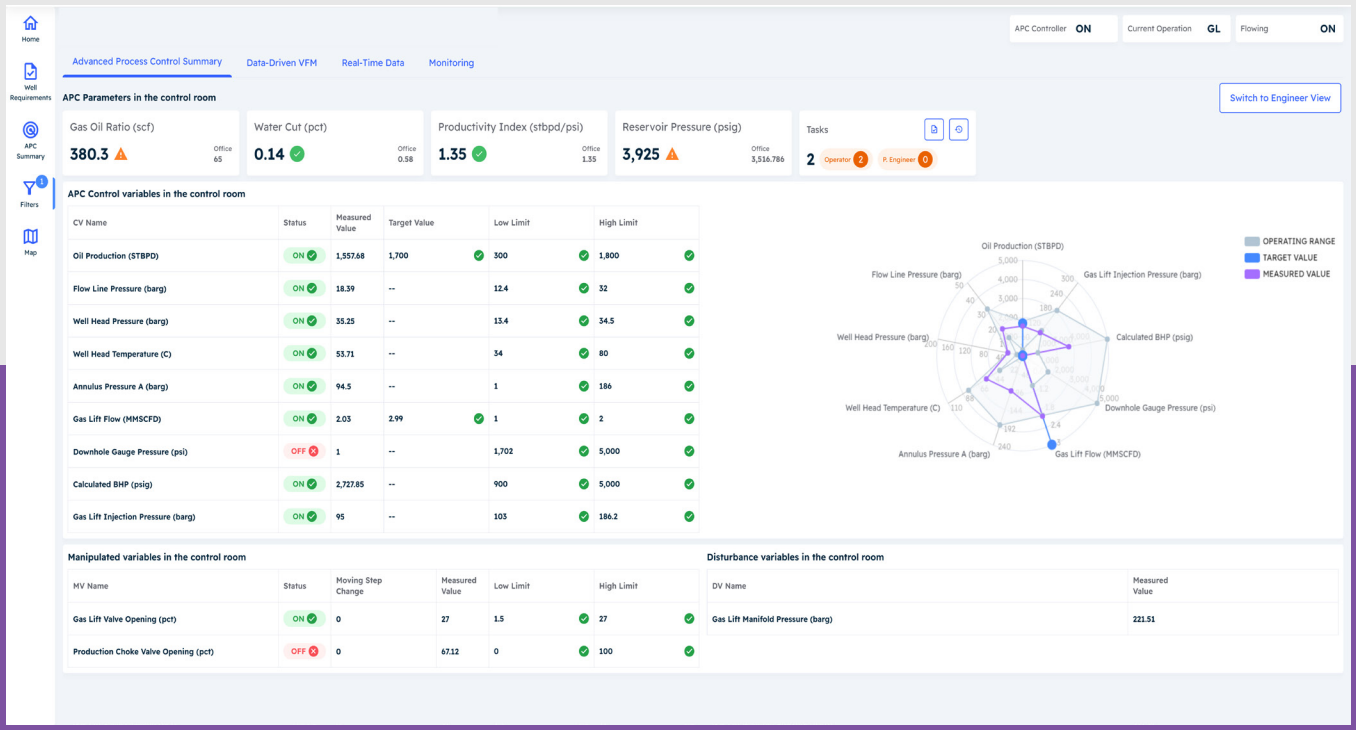
THE CLOUD

THE CONTROL NETWORK IN THE FIELD

The component in the field is tasked with executing the operation's work processes, which will adjust and control the well operation

The component in the Cloud contains a user-friendly interface to monitor parameters and assess the field component's operation, as well as the engineering work processes required to keep the data-driven models current. A set of alarms are included to alert office and operator users on the actions to be taken to maintain the models

CLOUD COMPONENT USER INTERFACE



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Application Approach

ROBOWELL MODELS:

FIELD

DYNAMIC LINEAR MODELS
(Runs every minute)
Reproduces dynamic response of the well when each variable changes

INFERENTIAL MODELS
(Runs every minute)
Estimates parameters in real time (i.e. virtual meters)

OFFICE

ML VIRTUAL METER MODELS
(Runs every minute)
Machine Learning models or algorithms that estimate production rates of oil, gas, or other fluids without the need for physical flow meters

EXPERT SYSTEM MODELS
(Runs every 15 minutes)
Knowledge-based systems or decision support systems, are tools used to assist in complex decision-making processes

WELL & SURFACE MODELS
(Runs hourly)
Mathematical and computational representations of the well and the surface facilities.

These models are used to simulate and analyze various aspects of well performance, and production operations

VALUE & BENEFITS

ROBOWELL

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> Significantly improves the economic and operational efficiency of the oil production process, & increases the overall asset net-present value

ROBOWELL's main business driver is to provide clear use cases for instrumentation and control technologies, augmented by using the latest data-driven and Machine Learning algorithms and software. The system's ultimate goal is to facilitate and/or achieve the real-time production optimization of wells to enhance well performance, adherence to reservoir guidelines, and faster response times to operational issues.

ROBOWELL helps maintain well operation within its safe operating envelope, minimizing the occurrence of trips due to operational upsets.

INNOVATION

- First application of Advanced Process Control (APC) technology for gas lift wells anywhere in the world
- Physics and AI framework to embed the APC scheme

EFFICIENCY MAXIMIZATION

- Keeps wells flowing at a target rate, regardless of backpressure changes
- Simplifies well management workload by production operators

PEOPLE ENABLEMENT

- Minimizes the asset's time spent on non-value-added tasks
- Nurtures the organizational mindset towards digitalization
- Facilitates tight-knit collaboration and knowledge-sharing among cross-functional teams

PROFITABILITY MAXIMIZATION

- Optimize gas lift requirements
- Maintains well operations within the desired operating envelope

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DISCLAIMER

This booklet contains numerical data that has been sourced from our esteemed clients. It is important to note that these figures are provided in the context of their respective business operations and have been shared with us for the purpose of this booklet.

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