HUB TECH IA

AI and IAGEN Application Use Case

Hydraulic Fracturing Design: AI Models Fracturing Propagation Fractures and Optimizing the Use of Resources in Argentina

Executive Summary – Application of AI and IAGEN for Fracturing Design Hydraulics in Vaca Muerta

This executive summary presents a strategic application of artificial intelligence (AI) and generative artificial intelligence (IAGEN) in the energy sector, focused on the design and optimization of hydraulic fracturing operations. This is a significant opportunity for Vaca Muerta, one of the main formations of unconventional hydrocarbons in the world, given their potential to improve the efficiency, sustainability and profitability in oil and gas extraction.

Use case classification

The report classifies this application according to the following axes:

1. By main resource: Oil, gas and water (comprehensive approach).
2. By activity: Optimization of production processes.
3. By technology: Generative models, machine learning, computer vision and big data platforms.
4. By strategic impact: Optimization of production and infrastructure.

1. Opportunities for using AI and IAGEN in the sector

Applications include accurate modeling of fracture propagation, Simulation of injection scenarios, dynamic adjustment of water and sand usage (proppant) and chemicals, and prediction of reservoir conditions in real time. These capabilities allow for the design of more effective treatments and

customized, reducing technical risks and improving operational results.

2. Expected benefits

The incorporation of AI and IAGEN contributes to:

- Increase operational efficiency with optimized treatments.
- Reduce costs through efficient use of resources.
- Improve hydrocarbon recovery by achieving more conductive fractures.
- Minimize environmental impact by reducing water and chemical consumption.
- Streamline decision-making through real-time data analysis.

3. Application of AI

AI is integrated into the fracturing process through algorithms that process data historical and real-time data, model the behavior of the subsurface and adjust automatically the operating parameters. This includes simulations of proppant transport, pore pressure predictions, and recommendations on chemical formulations tailored to each formation.

4. Proposed AI Agent

The report proposes the development of the intelligent agent OptiFrac AI, which aims to optimize the use of water, proppant, and chemicals in real time. This agent It incorporates specific modules for each resource, is fed with operational data and geological, and presents recommendations through a smart panel. Its function The main objective is to improve the efficiency of hydraulic fracturing design and execution, and Its key benefit lies in the automation of decisions, cost reduction and the sustainability of the process.

5. Conclusion

The application of AI and IAGEN in hydraulic fracturing represents a key transformation for the energy development of Vaca Muerte. It allows us to go from traditional methods to smart, adaptive, data-driven strategies that not only boost productivity but also promote better management.
more responsible with natural resources. Its adoption offers advantages competitive at operational, economic and environmental levels, aligning with the challenges

and opportunities in the Argentine energy sector.