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

Classification of deliverable report 26: "Hydraulic Fracturing Design: AI" Modeling Fracture Propagation and Optimizing Resource Use in Argentina":

Classification 1: By Main Resource

- Selected option: Oil, ÿ Gas, Water + energy (integral).
- Justification:

The document specifically addresses hydraulic fracturing, a technique key in unconventional oil and gas extraction, focusing particularly in optimizing the use of critical resources such as water, sand (proppant) and chemicals, which positions these three resources as central to the comprehensive approach of the report.

Classification 2: By Activity within Vaca Muerta

- Selected option: Optimization of Production Processes
- Justification:

The main objective of the report is to optimize the design and execution of hydraulic fracturing using artificial intelligence (AI) to model accurately propagate fractures, maximizing operational efficiency, reduce costs, increase hydrocarbon recovery and minimize environmental impacts. These goals correspond directly to the category of optimization of production processes in the exploitation of unconventional hydrocarbons.

Classification 3: Type of AI Technology Used

Main selected option:

1ÿÿGenerative AI Models,

2ÿÿMachine Learning Algorithms,

4ÿÿComputer Vision and Image Analysis Systems, 6ÿÿAI Platforms for Data Integration and Big Data.

- Justification:

  The report explicitly mentions the intensive use of advanced algorithms Machine Learning and Deep Learning for prediction and optimization fractures, advanced generative models for propagation simulations fractures, advanced analytical systems to optimize critical resources (water, sand, chemicals), and platforms for massive data analysis in real-time data from the operational field and geological models.

Classification 4: By Strategic Impact on the Industry

- Selected option: AI for Production and Quality Optimization Infrastructure
- Justification:

  The fundamental strategic impact described in the report lies in the significant optimization of the hydraulic fracturing process. This Optimization involves improvements in operational efficiency, substantial reduction in operating costs, increase in oil and gas extraction rates, and considerable reduction in environmental impact, directly contributing to the Optimization and sustainability of key energy infrastructure in Vaca Dead.