HUB TECH IA

AI and IAGEN Application Use Case

Advanced Drilling Trajectory Optimization Using Artificial Intelligence in Vaca Muerta

Classification of deliverable report 32: "Advanced Optimization of Trajectories of Drilling Using Artificial Intelligence in Vaca Muerta":

Classification 1: By Main Resource

- Selected option: Oil and ÿ Gas (main).
- Justification:

The document focuses directly on improving the trajectories of drilling to optimize oil and gas extraction in non-metallic formations Conventional resources such as Vaca Muerta. Production statistics and the benefits of applying AI to maximize performance in both resources are cited. making it clear that the main objective is to increase efficiency in the obtaining hydrocarbons.

Classification 2: By Activity within Vaca Muerta

- Selected option: Optimization of Production Processes
- Justification:

The central axis of the report is the real-time optimization of the trajectory of AI-powered drilling, including the use of autonomous geo-steering systems, sensors, and prediction algorithms to reduce time and costs and risks. This objective fits perfectly into the category of activities that improve the efficiency of drilling production processes and extraction.

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, 5ÿÿAI Systems Based on Intelligent Agents.

• Justification:

The report explicitly mentions the use of generative models, RNNs, Transformers, deep learning for time series analysis automated geological, agents that adjust the drilling trajectory and simulate scenarios with digital twins. A flow is also described complete agent for collection, analysis, simulation, execution and continuous learning, representing a comprehensive technological architecture and advanced.

Classification 4: By Strategic Impact on the Industry

• Selected option: AI for Production and Quality Optimization Infrastructure

• Justification:

The main impacts noted in the report include reduced operating costs (up to 30%), increased ROP, improved safety, early detection of unstable areas, and a clear competitive advantage.

These benefits translate directly into operational improvements, economic and security, strengthening critical infrastructure energy production in Vaca Muerta.