HUB TECH IA

AI and IAGEN Application Use Case

Optimization of Equipment Maintenance in Vaca Muerta through Machine Learning

Classification of report deliverable 23: Maintenance Optimization Teams in Vaca Muerta using Machine Learning:

Classification 1: By Main Resource

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

> The report is specifically focused on optimizing the
> Predictive maintenance of critical equipment used in the extraction, production,
> and transportation of hydrocarbons (oil and gas) in the
> Vaca Muerta region. Water is not a primary focus in this case,
> explicitly remaining outside the main classification of the document.

Classification 2: By Activity within Vaca Muerta

• Selected option: Optimization of Production Processes
• Justification:

> The report specifically addresses maintenance optimization
> predictive equipment management using machine learning techniques. The
> central objective is to minimize unplanned downtime, improve
> operational efficiency, extend the life of critical equipment and reduce
> costs, all fundamental aspects to optimize production processes
> in the oil and gas industry.

Classification 3: Type of AI Technology Used

- Main selected option:

  2ÿÿMachine Learning Algorithms, 6ÿÿAI

  Platforms for Data Integration and Big Data, 5ÿÿAI Systems

  Based on Intelligent Agents.

- Justification:

  The report explicitly details the use of advanced algorithms

  supervised, unsupervised, and reinforcement machine learning (such as

  regression, time series with LSTM networks, decision trees, SVM, random

  forests and autoencoders). In addition, it emphasizes the relevance of

  platforms that integrate IoT sensors and Big Data to collect data in

  real-time, as well as intelligent agents that automate detection

  early detection of faults, alerts and maintenance recommendations.

Classification 4: By Strategic Impact on the Industry

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

  The key strategic impact described in the report is the optimization

  substantial improvement in predictive maintenance, which leads directly to the

  significant reduction in unplanned downtime, extension of

  the lifespan of critical equipment, increased operational safety, and

  significant reduction in overall operating costs. These advantages clearly optimize

  both production and key infrastructure in

  Dead Cow.