HUB TECH IA

Deliverable report 3

AI and IAGEN Application Use Case
Analysis and motivation on extraction sites
Report Writing in Vaca Muerta, Neuquén

I. Introduction

The oil and gas industry, in its constant search to optimize operations and reducing costs, is in a stage of technology-driven evolution. In In this scenario, Artificial Intelligence (AI) emerges as a tool with a transformative potential for Vaca Muerta, Neuquén. Generative AI, in particular, is opening up a range of possibilities for writing reports in this sector, with the ability to create original and unpublished content.

II. Generative AI: A New Era in Report Writing

Generative Artificial Intelligence (GENAI) is a branch of artificial intelligence that focuses on creating new content, such as models, images, code, or text, from existing data. This technology uses advanced algorithms to analyze large amounts of information, identify patterns and generate new content and original that is often indistinguishable from that created by humans.

This technology has the potential to revolutionize report writing in Vaca Dead by automating tasks, improving efficiency and reporting quality, and

facilitate decision-making.

III. Summary Table of Generative AI Tools

It is interesting to take into consideration that it is possible to incorporate modules of automatic generation of reports and reports in the production processes and that are generated in real time from the processing of new data sets and constant manner.

Generative AI has the potential to significantly improve efficiency and quality of report writing in Vaca Muerta. By automating tasks, analyzing data and identify trends, Generative AI allows you to generate more reports quickly, more accurately, and with a higher level of detail.

In addition, Generative AI can contribute to the creation of more comprehensive reports and objectives by providing deeper analysis of data and reducing errors humans. This enables professionals to make more informed decisions and strategic.

Tool	**Description**	**Advantages**	**Disadvantages**	**Examples of use in Cow Dead**
ChatGPT	Platform of AI for trigger text. Allows create information,	Increase in the productivity d, creation of content original.	Possible generation of information inaccurate, risk of biases.	Used by companies to access to information of shape fast and

	summaries, translations and answer questions of shape conversation nal.			efficient. It is must have into account that exist versions of payment with functions further advanced.
DALL-E	Tool of AI for trigger images to to leave of description text s.	Inspiration creative, automation task assignment.	Possible generation of images inappropriate , risk of biases.	Could be used to generate images for reports or presentation is.
Security Copilot	Solution of cybersecurity ad with AI that uses the analysis of data and the learning automatic for detect and	Information personalized a, increase of the efficiency.	Dependence of the technology, possible lack of transparency to.	Used by companies as CGC to reinforce his cybersecurity ad.

	answer threats.			
Video analytics with OpenCV	Algorithms for detect anomalies in torches using vision artificial and analysis of images.	Improvement the security in the refineries.	Requires cameras of spectrum infrared.	Used by YPF for detect events of high noise and emissions high of black smoke in torches13 .
Random Forest Survival	Algorithm of learning automatic for predict the time to the fault of equipment, as bombs mechanics.	Allows assign a risk of fails to the wells.	Requires data historical and of sensors.	Implement given by Pan American Energy for predict failures in the wells with pumping mechanic.
Assistant Digital of Wells	System of monitoring of wells	Optimize the monitoring and the taking of	Requires the integration of different	Developed by Bread American

	that uses AI to analyze data in real time and optimize the operation nt.	decisions.	sources of data.	Energy for monitor the state of the wells and optimize your operation nt.

IV. IAGEN Agent Proposal for Implementation

1. Concept of IAGEN agents

In recent years, generative artificial intelligence (GAI) has revolutionized the way we interact with technology, enabling the development of systems capable of generating content, answering complex questions and assisting with tasks high-demand cognitive skills. From this capacity, a new architecture emerges Technological: IAGen-powered agents. These agents are not simple conversational interfaces, but autonomous systems that can interpret instructions, make decisions, execute tasks and learn from their interactions with the around.

An IAGen agent combines large language models with components additional features such as external tools, memory, planning and autonomous execution. This allows them to operate in complex environments, with the ability to break down objectives in steps, coordinate multiple actions, interact with digital systems (such as databases, APIs or documents) and adapt to context changes in real time. These qualities distinguish them from traditional chatbots, and open a spectrum of more sophisticated and customizable applications.

At the organizational level, these agents are being used to automate

processes, generate data analysis, assist in decision making and improve the user experience, both internally and externally. For example, they can assume human resources, legal, financial or logistical tasks, and even those linked to the technical areas of production processes, acting as intelligent assistants that collaborate with human teams. This ability to integrate knowledge and execute tasks autonomously transforms the way organizations can scale your operations without losing quality or control.

In addition, agentic workflows—structures where multiple agents collaborate with each other to solve complex problems—allow responsibilities to be distributed between different agent profiles, each with specific functions. This generates Hybrid work environments where humans and agents coexist, optimizing times, costs, and results. The ability to connect agents with tools such as Google Drive, CRMs or document management platforms further expands its capabilities.

The development of IAGen-powered agents represents a crucial step towards a new era of intelligent automation.

Among the benefits of authentic workflows driven by business models generative artificial intelligence, the possibility of automating processes is found complete, end-to-end production systems, and even add value from the leveraging the skills of language models based on these technologies.

However, its implementation also poses technical, ethical and legal challenges, from responsible design to human oversight. Therefore, understanding your architecture, its operational logic and its potential impacts is fundamental to its effective and safe adoption in various professional contexts.

2. AI agent design proposal

- Data Collection: Integrate seismic, drilling, IoT (Internet of Things) sensor data, and other relevant sources into a unified platform. • Processing with IAGEN: To identify correlations, patterns, and anomalies.
  in the data.
- Generation of Predictive Models. Develop predictive models that allow us to anticipate events such as equipment failures, changes in the production or security risks.
- Scenario Assessment. Analyze predictive models and compare them with previously discovered deposits to make informed decisions about exploration, drilling and production.
- Actionable Report Generation. Create reports with recommendations. strategies based on data analysis and scenario evaluation.

V. Advantages of Generative AI in Report Writing

Generative AI offers several advantages for writing reports in Vaca Dead:

- Greater efficiency and productivity: The automation of tasks and the ability to Analyzing large volumes of data allows you to generate reports more quickly fast and efficient.
- Cost reduction: Automating tasks and improving efficiency reduce the costs associated with report writing.
- Increased security: Generative AI can contribute to security in operations by analyzing real-time data and identifying potential risks.
- Reduction of environmental impact: Generative AI can optimize energy consumption energy in oil and gas operations, contributing to the reduction of carbon footprint and a more sustainable approach.

VI. Challenges of Generative AI

While Generative AI offers significant advantages, it is crucial to consider its Disadvantages and challenges:

- Information Accuracy: Generative AI models can generate inaccurate information or "hallucinations" if not trained with high-quality data. Ensuring data quality is essential to obtaining results reliable.
- Biases: Generative AI models can perpetuate existing biases in the data with which they train. It is necessary to be aware of this risk and take measures to mitigate it.
- Data privacy and security: The use of Generative AI poses challenges in relation to data privacy and security, especially when it comes to They use sensitive data. It is important to implement security measures adequate to protect confidential information.
- Ethical challenges: Generative AI raises ethical challenges, such as the possibility of job losses and the need to ensure responsible use of technology. It is essential to address these challenges proactively and ethically.
- Intellectual property: There is uncertainty about the intellectual property of the Generative AI-generated content. Legal frameworks need to be established clear guidelines for regulating intellectual property in the context of AI.
- Lack of transparency: Generative AI models can be complex and difficult to understand, making it difficult to identify errors or biases. It is It is important to develop more transparent and explainable models to generate trust in users.

VII. Risk mitigation strategies

It is essential to consider the ethical implications and challenges posed by AI. Generative in the writing of reports in Vaca Muerta. It is necessary to ensure that the technology is used responsibly, data privacy is protected and

to avoid the perpetuation of biases.

It is also important to address challenges related to intellectual property.
of the content generated by Generative AI and the need for transparency in the
decision-making processes.

The introduction of Generative AI in the oil and gas industry requires a
ethical and responsible approach. Companies must be proactive in building
ethical governance and oversight of its Generative AI tools, considering
the problems of bias, transparency and the impact on jobs.

It is recommended to initiate research into the impact of IAGEN-based agents.
In this context, short-term investment in implementation teams is useful.
AI agents in technology and training.

Investment in proof of concept and pilot testing is required. The focus here is on
be the training of talent to implement, since a trend is verified
cost reduction in systems that enable “no code” and “low code” automation.
For the first stage, it is also recommended to use teams with experience in
design and implementation of AI agents. Finally, it is key to form an “in” team
"house" for the accompaniment and appropriation of an agentic culture that redefines
human-machine interaction.

VIII. Conclusions

Generative AI is presented as a tool with enormous potential for
transform the writing of reports in Vaca Muerta. While it is still in its infancy,
early stages of development, this technology offers a number of advantages in terms
of efficiency, quality, safety and decision-making.

However, it is crucial to address the disadvantages, ethical challenges and implications long-term use of Generative AI to ensure responsible and beneficial use for industry and society.

Vaca Muerta, with its abundant energy resources and stable environment, has the potential to become an AI technology hub. The combination of energy, Technology and innovation can drive economic growth and development region.

It is important to note that the competitive landscape of the oil and gas industry will be transformed by AI before 2030. Companies that adopt AI will responsible and strategic manner will be better positioned for success in the future.

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