

ASK ESA

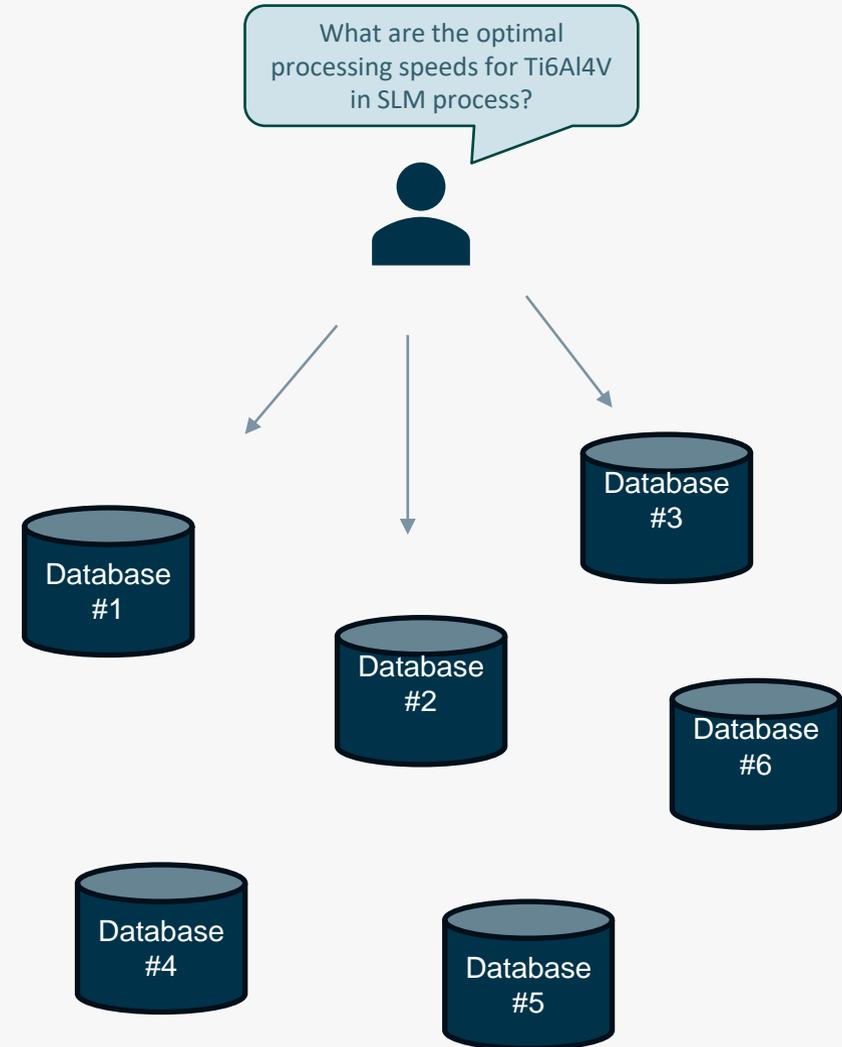


**PROBLEM TO BE
SOLVED**



PAIN POINTS FOR ESA USERS

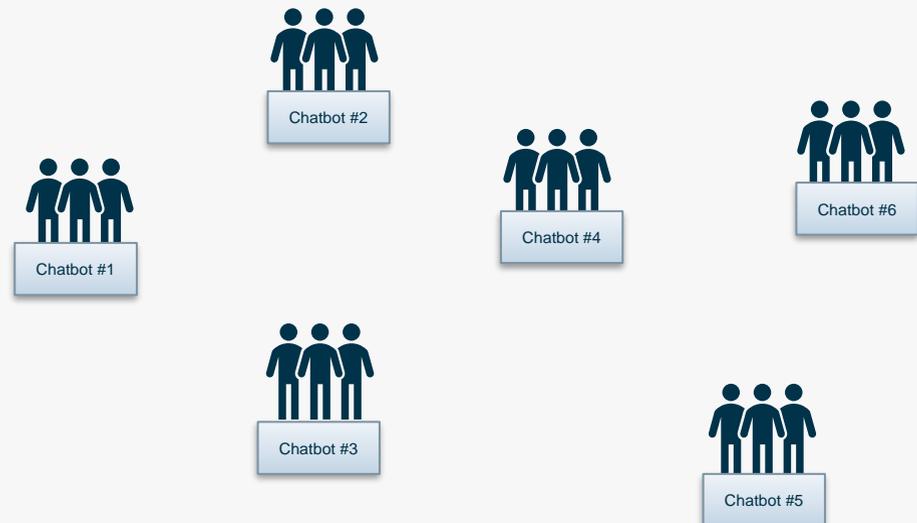
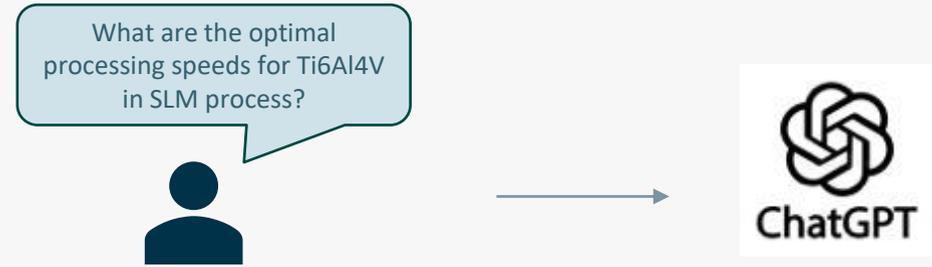
1. Scattered information across different repositories
2. Loss of time to retrieve valuable information





NO ACTIONS MEANS...

1. Risk to use external black-box chatbots
= Potential leak of confidential data
2. Siloed ESA teams creating their own shadow GenAI solutions
= Duplication of efforts





BUSINESS OBJECTIVES



FOR THE USERS

Accelerate time retrieval of valuable information

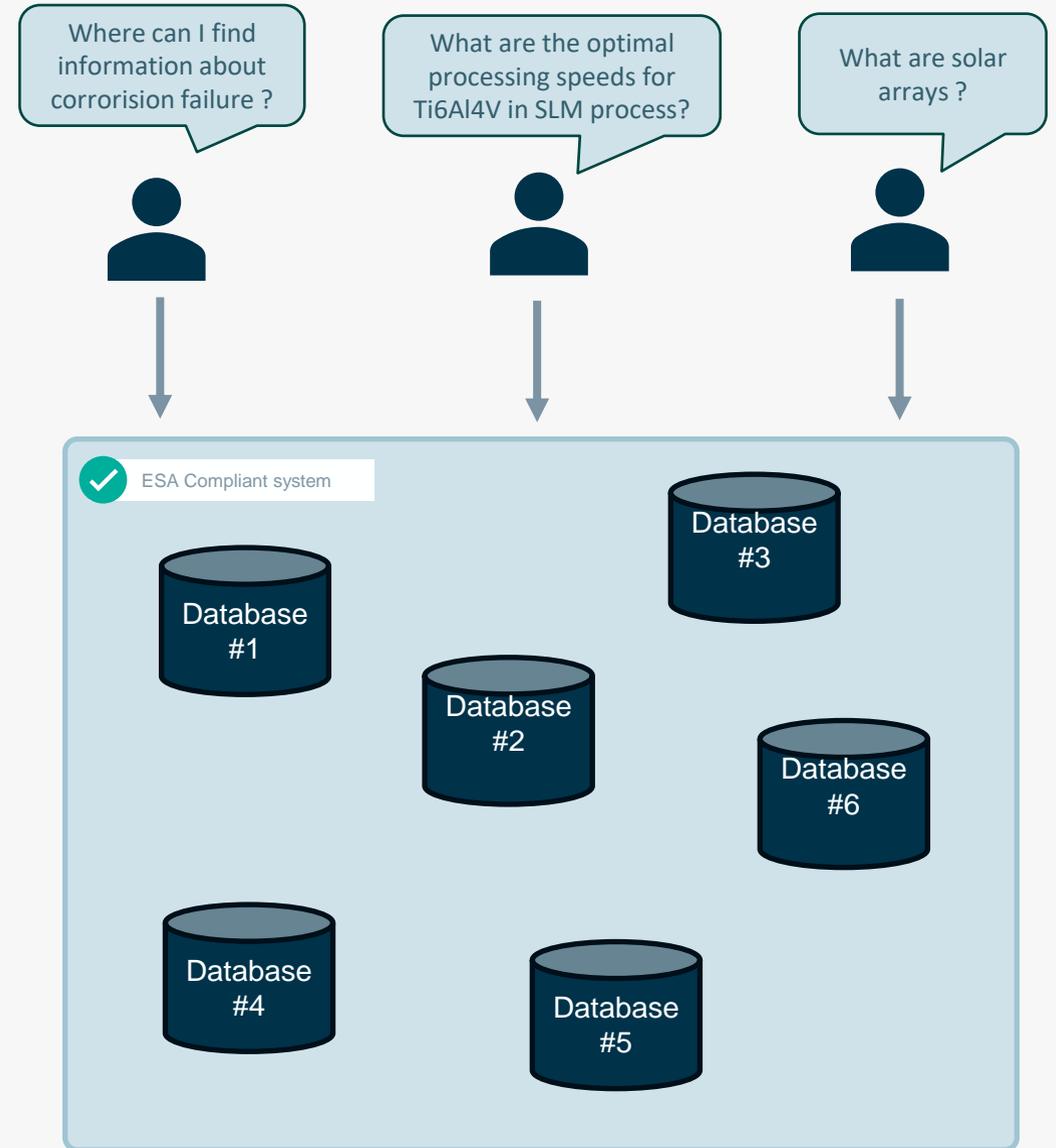
- Increased efficiency
- Gathered data and insights easily
- Improved user experience

FOR ESA



Provide a safe, secure and reliable solution. Compliant with ESA rules.

- Solution on premise
- Sovereignty over the data





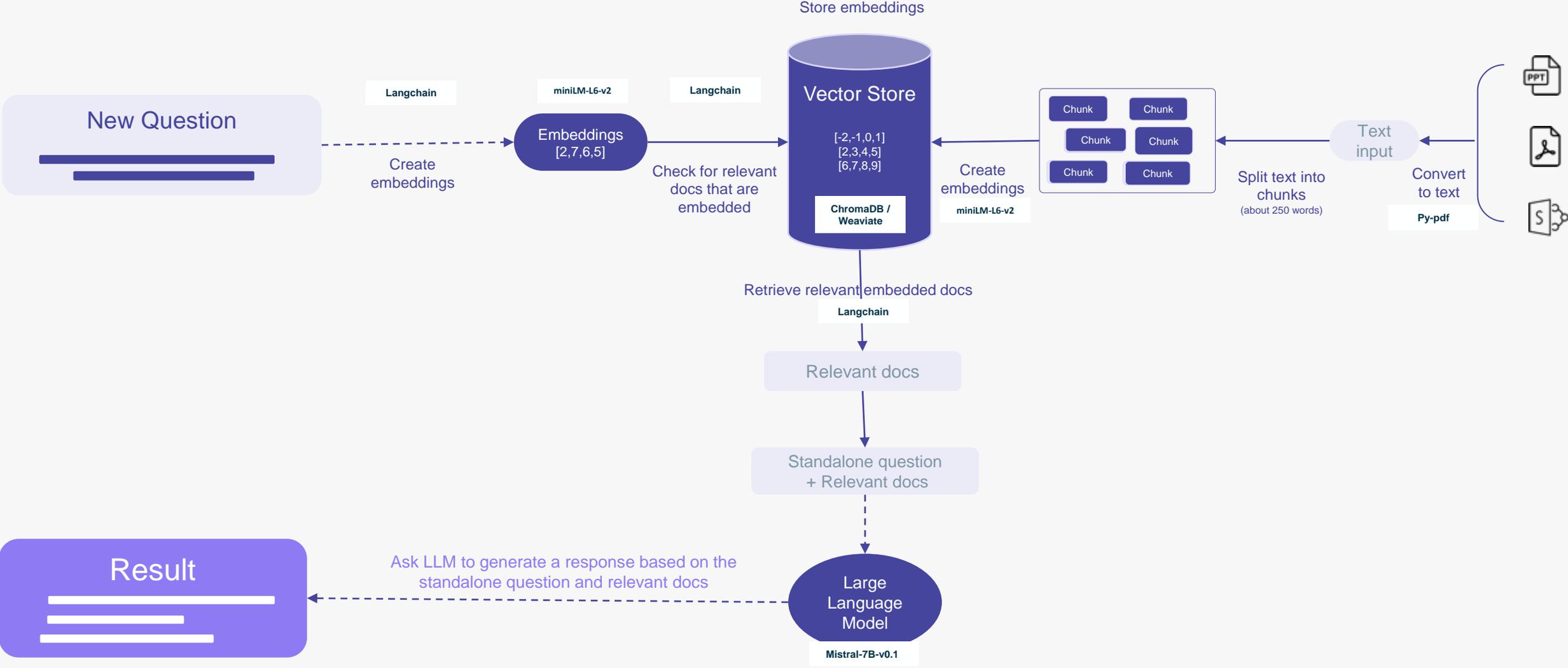
SOLUTION

HOW DOES IT WORK ?

APP/UX

ESA CLOUD

SOURCES



DEMO

TEC-Mate Material

Disclaimer: Responses generated by Artificial Intelligence techniques and might occasionally be imperfect. Please verify responses before using them for important decisions.

Chatbot

Summarize the QMP criteria for additive manufacturing according to NASA

According to NASA's Technical Standard, a Quality Management Plan (QMP) for Additive Manufacturing (AM) is a crucial element that governs the engineering and production practices. The QMP operates in conjunction with a Quality Management System (QMS), which ensures quality assurance from the foundational processes through part placement into service. The requirements of this NASA Technical Standard fit under the umbrella of an Additive Manufacturing Control Plan (AMCP) and the QMS.

The scope of a QMP can vary depending on the classification of parts (A, B, or C) that are to be produced using the QMP, leading to different hierarchies such as QMP-A, QMP-B, or QMP-C. A

Your Query

Search Results

and Processes, NASA -STD -6030; and Figure 3, Symbol Legend for Key Products and Processes , outline and illustrate the key products and processes controlled by this NASA Technical Standard and, figuratively, how each is related . Figure 1 summarizes the organization of this NASA Technical Standard . It begins with the general requirements for an Additive Manufacturing Control Plan (AMCP) to govern the engineering and production practice. The AMCP always works in parallel with a Quality Management System (QMS), which provides quality assurance from establishing the foundational processes through placing the part into service. Under the umbrella of the AMCP and the QMS , Figure 1 outlines how the requirements of this NASA Technical Standard fit into

[2021-04-21 NASA-STD-6030-Approved.docx.pdf\[Page: 10\]](#)

process capability in a configuration -controlled QMP record for each AM machine. The scope contained in the QMP can scale depending on the classification of the parts (A, B, or C) the CEO wishes to produce using the QMP, resulting in the hierarchy of QMP -A, QMP -B, or QMP -C. It is important to note that a QMP record does not contain all aspects of the process development effort that led to the QMP. The QMP record contains the definition of the final process and supporting data. Qualified machines and trained operators are key foundational controls required by this NASA Technical Standard and are implemented through NASA -STD -6033, Additive

MAIN USE-CASES

- Find a specific info
- Explanation of a concept
- List relevant papers
- Create synthesis
- Describe acronyms
- Compare 2 docs (reviews)
- Check latest updates
- Mention if response is unknown
(minimize hallucination)

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FEEDBACK

Feedback collected from 20+ testers across 18 different prototypes

ACCELERATE THE RETRIEVAL
OF VALUABLE
INFORMATION

X10

TIMES FASTER

TIME GAIN

30 - 180

MINS

ON AVERAGE

50

USERS/DAY

“It eases knowledge sharing over long time scale missions”

“It is useful for onboarding newcomers”

“It is useful to leverage full potential of ESA accumulated expertise & knowledge”

“It helps to search in the right direction”

“ It accelerates troubleshooting & reviews”

ASK ESA PLATFORM

 Existing

 To be implemented

SECURITY



Security Assessment
Initiated – no major threats detected



On premise
Virtual Machine
ESA cloud



Vector Store
Sensitive/Confidential information can be protected



Robust Access control
Data management set-up



PL2 certification
Secured system

FLEXIBILITY



Open-Source Stack
Speed & evolution of capabilities



Interoperable
Integrable with other internal / external system eg. Polaris, Eclipse...



Flexible
API delivery
Customisation possible
Use of other LLMS.



Scalable
Handle higher number of users, data sources, specific use cases, speed



Cost model
Low and predictable cost



Automatic ingestion of documents
Full control data owners

CAPABILITIES



Multimodal search
Enhanced search tables/graphs/ images/videos



Conversational experience
Ability to ask follow-up questions



Comparison information tool
Ideal to compare / evaluate multiple documents (tenders, reviews, version comparing...)



Chat with your document
Converse with a on a lengthy document



Curation with most updated documents
Selection of most accurate and recent documents



Evaluation of an idea
Easily spot the novelty of an idea

ASK ESA PLATFORM OBJECTIVES

#2 Safe & independant solution, putting ESA in full control

**ASK
ESA**



Security

Alignment with ESA security policies. Fully opaque screen on ESA proprietary assets when deploying on-premise.

Bias-control

Mistral models demonstrate top level performance when it comes to gender, religion, politics and ethnicities biases. See benchmarks (e.g., BBQ or BOLD)

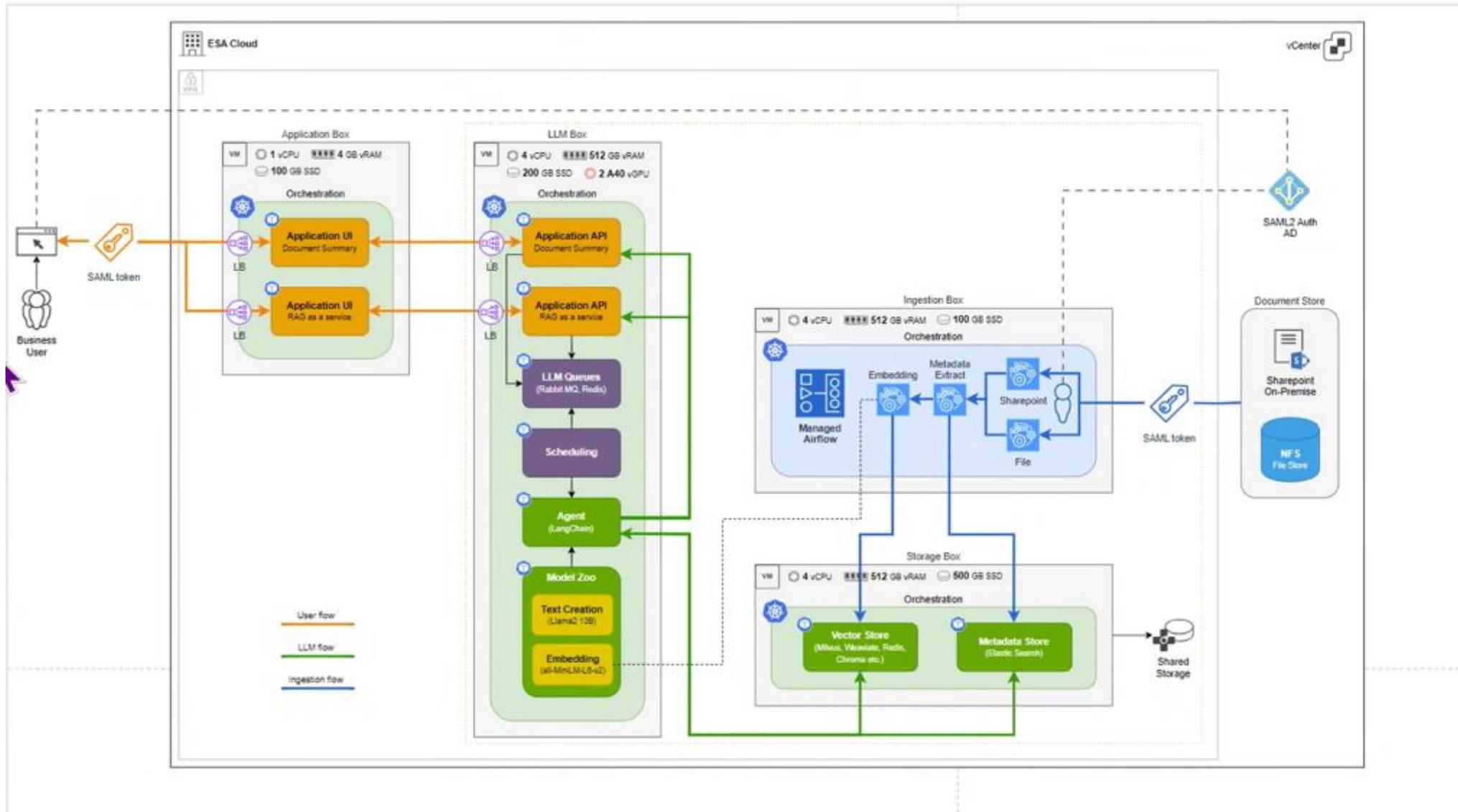
Guardrails

ESA can define what is appropriate for your specific use-case
Customers can make their own editorial choices for optimal adapted control

Privacy

APIs do not track users inputs or leverage outputs for training

TECHNICAL ARCHITECTURE



ASK ESA PLATFORM OBJECTIVES

#1 Take ESA users to the next level of GenAI adoption



High performance & efficiency

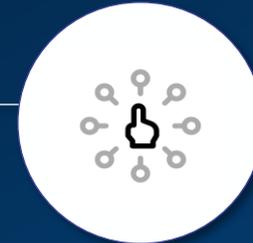
Scale without compromising on performance thanks to small size models

GPU needed. Small A100 - Large 3-4 A 100



Flexible integration & deployment

Deploy how and where ESA customer wants, matching the requirement of each use case



Easy customization

Get the most value from customer data

VALUE PROPOSITION - QUALITATIVE

BENEFITS



- **Accelerating the retrieval of valuable information** across multiple documents at ESA on a common vector store, allowing the cross-fertilisation between departments/directorates.



- **Improve productivity and efficiency** of ESA employees using cutting edge technology and benefits from evolution



- ASK ESA could benefit from the huge computing capability currently developed with the **HPC center (High-Performance Computing)**.



- **ASK ESA solution being opened and easily interfaced with other systems**, all directorates could benefit from this platform by co-developing specific solutions by integrating the LLM.



- **Enables to develop an internal competency center**, allowing to answer to ESA very specific needs in the AI domain leveraging AI competences across ESA.

DIFFERENTIATORS



- **Open-source LLM Mistral and fully hosted on ESA premises**, ASK ESA is an independent AI-based product ensuring that no ESA data is processed/sent/shared outside.



- **Scalable & Customisable** to each specificities of the different use-case in the Agency (Speed & evolution of capabilities)



- **ESA internal Vector Store** (Sensitive/confidential information can be protected) PL2 certification



- **Interoperable** (*Integrable with Azure or other platforms*)



- Cost model, **predictable and low cost**

BUSINESS PROCESSES



- RAG-as-a-Service or information Retrieval
- Context-as-a-Service or inference generation
- Document or Content Summarization
- Personalized Content Delivery Service
- Virtual Assistant / Chatbot

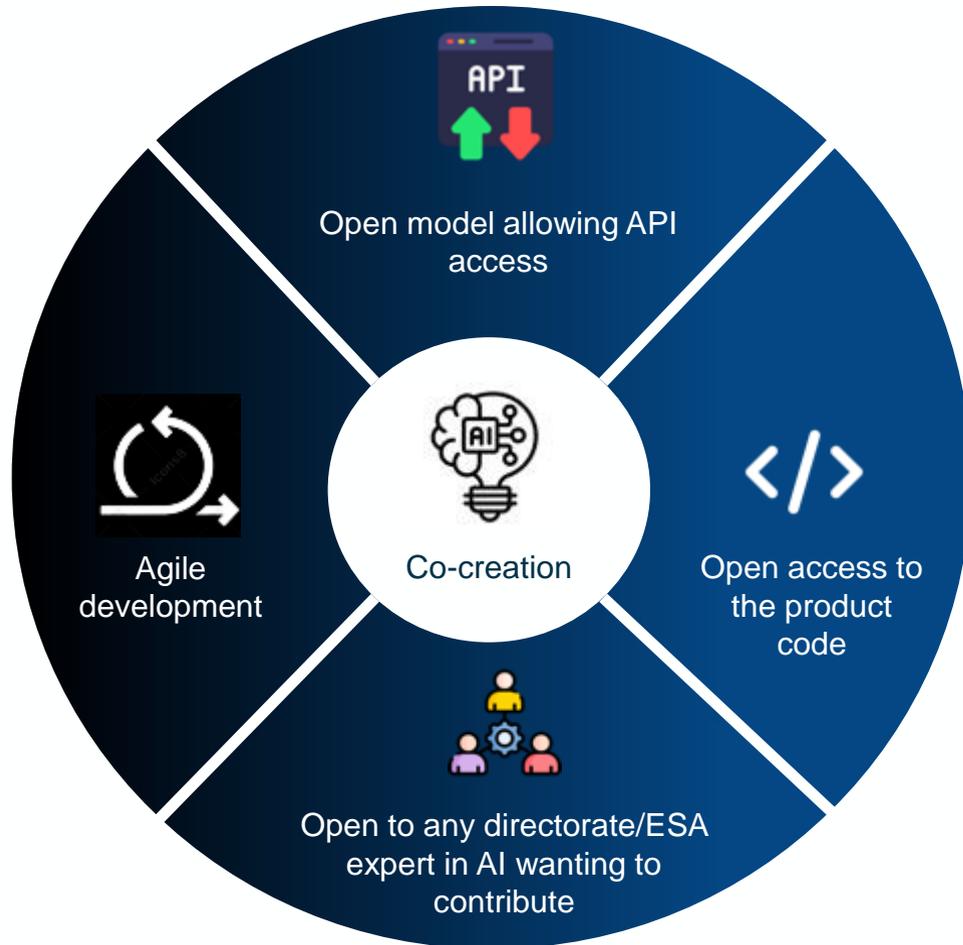
Harmonisation / standardisation



- A full turnkey corporate platform that can help the Agency for RAG/GPT needs
- Accelerate reviews and troubleshooting

Project ASK ESA - Building an ESA Co-development environment in AI

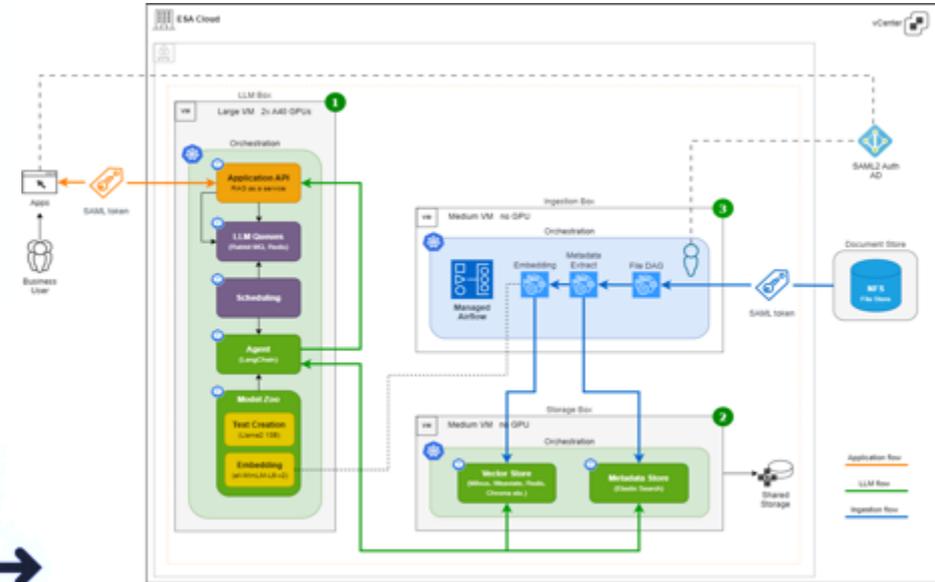
ESA-AI CO-DEVELOPMENT FRAMEWORK



PRODUCT MANAGEMENT (HIF-IA)



Agile - Continuous improvements in Sprints mode
6 weeks cycle



ASK ESA

DXC - Service provider CANG

Differentiators

ASK ESA vs Copilot

Feature	 Copilot Enterprise	 ASK ESA
Data	Relies on Microsoft's cloud data	Leverages ESA internal data sources. Enhanced answers quality*.
Security	Data resides on Microsoft's servers.	On-premise deployment offers more control
Privacy	Recently suspended at ESA due to data privacy concerns	Built in-house. Sensitive info never leaves the ESA network.
Transparency	Black-box like OpenAI. More opaque.	White-box model approach. See which internal documents or code snippets influenced the system's suggestions
Customization	Limited customization options, more standardized	Highly customizable (models, data sources, interface)
Cost	Subscription-based (per user)	On-premise deployment + Maintenance
Performance	Potentially faster due to cloud-based infrastructure	Optimized for specific tasks and workflows

*From the study *Copilot vs. Cosmobot at ESA* : [more info here](#)

Differentiators

Other considerations

- 1. RAG is a good option for customisation**
- 2. Mistral AI is European**
- 3. Build up AI internal competences at ESA**



QUESTIONS